

# Reconstruction Lower Deck Lighting (Contract No. 04-4027)

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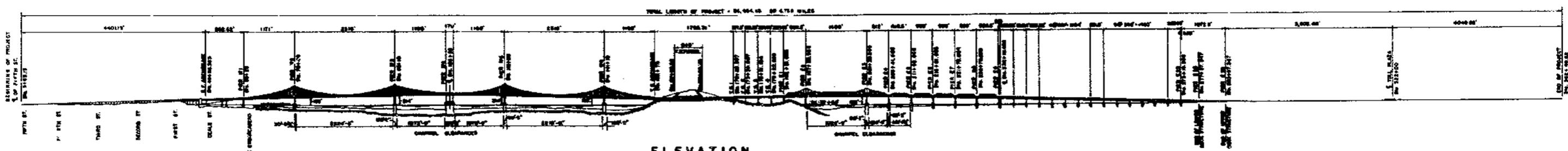
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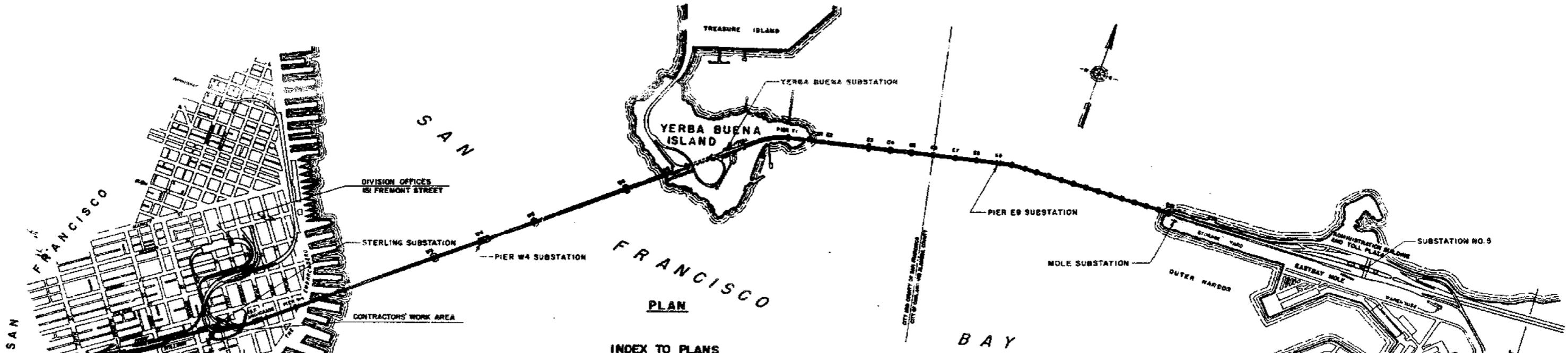
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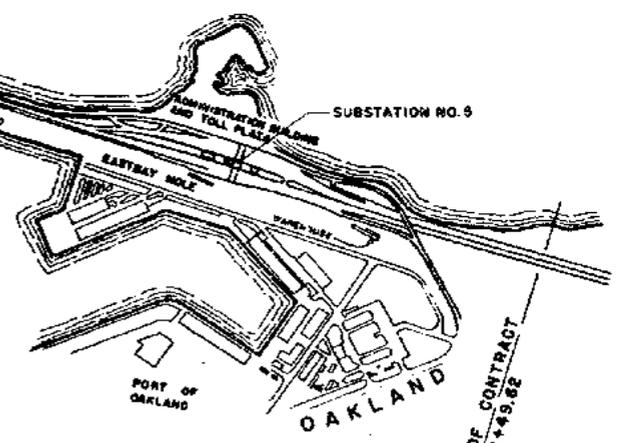
ELEVATION



PLAN

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STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

**SAN FRANCISCO-OAKLAND BAY BRIDGE  
 RECONSTRUCTION  
 LOWER DECK LIGHTING**

**PROJECT PLAN AND ELEVATION**

REVISION	DATE	DESCRIPTION	BY	CHK
36	4-25	As built with revisions		
37	4-25	Sheet No. 43, 44 and 45 added		

SCALE 1"=1000'

BRIDGE 34-04

SHEET NO. 1

DRAWING C-4027-14

GENERAL NOTES - ALL WORK

NO	BID ITEM	QUAN.	UNIT	DESCRIPTION
1	removing and storing miscellaneous electrical materials.	12,699	pounds	<p>shall consist of removing all miscellaneous electrical materials indicated on the plans to be removed, except as specifically included under other bid items, and storing all removed materials not immediately reused. This work shall include but shall not necessarily be limited to the removal and storage of the following materials: electrical cable and wire, conduits with all fittings, junction and connection boxes; pipe support brackets and angles; 15-KVA lighting transformers, 10-KVA current series lighting regulators, and series relays in the Sterling Substation; light control combination in the Note Substation; and all fastenings and supports appurtenant to the material and equipment to be removed and stored.</p> <p>All removed cable and wire shall be neatly and continuously coiled and stored in bins in the Division's warehouse.</p> <p>Measurement for payment will be by the pound, scale weight, of electrical materials removed as shown on the plans and as specified whether or not reinstallation is required under other bid items.</p> <p>Oil filled substation equipment shall be weighed and stored with the oil intact.</p> <p>Openings in the existing junction boxes on the 1-1/2 inch conduit runs between bents 21 and 41 resulting from the removal of the 3/4-inch conduit shall be plugged and full compensation therefor will be included in the unit price paid for this bid item.</p>
2	removing and storing bracket mounted sodium vapor luminaires.	164	each	<p>shall consist of removing, disassembling, transporting, and storing single or double unit bracket mounted sodium vapor luminaires, including brackets and insulating transfer wires, and making all necessary splices in the cables following removal of insulating transformers and secondary wiring. Cable splices shall be of the type shown on the plans for the respective class of cable. Full compensation for such splicing work will be included in the unit price paid for this bid item.</p> <p>Removal of conduit and wire running between the luminaire and the insulating transformer will be measured and paid for under Bid Item 1. Removing and storing miscellaneous electrical materials.</p> <p>Removal of a double unit bracket mounted sodium vapor luminaire will be measured and paid for as one removal under this bid item.</p>
3	drilling holes in concrete (two inch diameter).	237.26	linear feet	<p>shall consist of core drilling holes in existing concrete for 1-1/2 inch rigid conduit in locations shown on the plans. The length of hole to be paid for will be the center line length of hole actually drilled.</p>
4	miscellaneous details.	2,067	pounds	<p>shall conform to the applicable requirements of Section 11 and shall consist of furnishing and installing all metallic materials not specifically included under other bid items complete in place including cleaning and painting. This work shall include, but shall not necessarily be limited to furnishing and installing the following materials: termination boxes for Type I cable; junction, connection, and pull boxes having any inside dimension of six inches or greater; three-inch and four-inch diameter rigid conduit with all connections and fastenings; and all channel type cable and conduit supports.</p> <p>Conduit furnished under this item shall conform to the applicable requirements of Sections 60 and 61.</p> <p>All ferrous materials installed under this bid item shall be hot-dip galvanized.</p> <p>Measurement for payment will be by the pound, scale weight, of materials installed.</p>
5	tap boxes for Type I cable.	180	each	<p>shall consist of furnishing and installing tap boxes, clamps, cable connectors, studs, and all fastenings; adjusting existing Type I cable; stripping and existing cable; clamping cable clamps to boxes and all incidental work and materials required to install the tap boxes complete in place as shown on the plans including cleaning and painting.</p> <p>Tap boxes shall be fabricated from not less than 12 gauge sheet steel, or cast to an approved thickness in the sections. Cable and tap box assemblies shall be weatherproof and watertight. Tap boxes shall be hot-dip galvanized after fabrication, except that boxes fabricated from approved corrosion resistant metals need not be galvanized.</p> <p>Insulating blocks for tap provisions shall be glass reinforced polyester as manufactured by the Glass Corporation, or equal, and all conductive tap box materials shall be copper conforming to ASTM Designation: B187.</p> <p>Type 17 cable clamps at tap boxes shall be GE Electric Manufacturing Co., Inc., Catalog Style PM, or equal. Cable entries for Type I cable shall be lined with thick polyurethane or neoprene seals.</p> <p>The Contractor shall submit to the Engineer for approval, before start of fabrication, one prototype tap box complete with detailed drawings. The contractor shall perform a simulated final installation test in the presence of the Engineer by vibrating the box not less than 1/2-inch in two directions through a minimum of 3,000,000 cycles at 150-200 cycles per minute. Full compensation for performing tests shall be included in the unit price paid for this item.</p> <p>Tap boxes installed under this bid item are to provide branch circuit connections from Type I cable to Types 60, 6D, and E fluorescent luminaires. Type I cable shall be installed in tap boxes by complete removal of insulation materials, and under no circumstances shall cable conductors be severed.</p> <p>All fastenings shall lock tight and be fabricated from a non-ferrous metal that provides maximum resistance to the marine environment and automotive corrosion gases.</p>

PLANS

- Section numbers used in contract work sheets refer to the particular Standard Specification Sections as prepared by the Division.
- Plans used for original construction, and other information pertaining to the work, will be made available at the Division's office to those interested.
- Details, dimensions, and elevations of existing structures shown on the plans are from original construction drawings and are representative of typical conditions; minor variations therefrom are to be anticipated. Where new work is to join existing, the Contractor shall verify in the field all controlling conditions and dimensions prior to the preparation of details of work to be submitted for approval by the Engineer.

INCREASE OR DECREASE IN QUANTITIES

- For the work covered in Bid Item 4 no adjustment to the unit price paid will be made because of an increase or decrease of more than 2% percent in the contract quantities.

REMOVED MATERIALS

- Materials designated to be removed and relocated, reinstalled, or used shall be removed with all reasonable care and cleaned of all foreign material, ready for storage or re-use. Materials to be stored shall be transported to and stored in the Division's Warehouse on the Kenton Bay in locations to be designated and as directed by the Engineer. Any materials designated to be removed and reinstalled, relocated, or stored which are unnecessarily damaged by the Contractor, or by others while under his control, shall either be repaired to the satisfaction of the Engineer or shall be replaced in kind at the expense of the Contractor.

- Unless otherwise specified or permitted by the Engineer, materials designated to be removed and stored shall be stored immediately after removal.

- Materials designated to be stored shall be segregated according to size, type, shape or other category and shall be properly identified by tag, stencil mark, or other means approved by the Engineer. All bolts shall be stored with washers on and nuts run down.

- Materials removed and not to be reinstalled or stored shall become the property of the Contractor and shall be disposed of by him outside of the contract limits and full compensation therefor will be included in the unit and lump sum prices paid for the various bid items required for such work.

NEW AND STATE-FURNISHED MATERIALS

- Full compensation for furnishing and installing any new materials and doing all the work required to adapt new or State-furnished materials to locations shown on the plans will be included in the unit and lump sum prices for the various bid items. Wherever suitable State-furnished materials are not available, the Contractor shall provide new materials as required in accordance with the specifications.

STEEL WORK

- Where removing or removing and reinstalling existing structural steel is required to perform the work of this contract and such work is not specifically provided in the bid item descriptions, such removing or removing and reinstalling shall be performed by the Contractor and full compensation therefor will be included in the unit and lump sum prices paid for the various bid items required for such work. The Contractor shall submit plans for the Engineer's approval before performing such work.

- Dimensions, weights, and properties of rolled steel structural shapes shall match those set forth in the Steel Construction Manual of the American Institute of Steel Construction.

- Welded steel members shall be fabricated to the dimensional tolerances set forth in the Standard Specifications for Welded Highway and Railway Bridges of the American Welding Society.

- Needs of bolts installed on longitudinal members shall face the center line of the lower deck, and on transverse members shall face the traffic flow of the completed bridge.

GALVANIZING

- All materials required to be galvanized (except as otherwise provided for electrical conduit) shall be hot-dip galvanized as specified for structural steel in Section 11 after fabrication. Galvanized materials shall be loaded, heated, and handled in such a manner that the galvanizing will not be damaged. All abraded and damaged galvanized surfaces shall be re-galvanized or if permitted by the Engineer, may be repaired by thoroughly wire brushing the damaged area, removing all loose and cracked spelter coating, after which the cleaned area shall be painted with two coats of paint conforming to the requirements of Military Specification MIL-P-21035. Full compensation for galvanizing and galvanizing repairs, wherever required, will be included in the unit and lump sum prices paid for the various bid items.

MIL-P-21035 is abstracted as follows: Zinc dust to meet Type 1, 75-2-20, either ready mixed or in two compartment containers with resin, oil, and solvents; Pigment not more than 4 percent of nonvolatile, not more than 12 pounds per gal. of paint; Zinc not more than 97.5 percent; Flash point not under 80° F.; Container stability one year minimum; Salt spray resistance to allow no blistering, adhesion loss, and not more than 5 percent rust after 288 hrs. exposure.

CLEANING AND PAINTING

- All new ferrous materials shall be cleaned and painted except that new galvanized materials in the substation, sodium plated threaded junction boxes, stainless steel, and cast iron need not be cleaned and painted.

Cleaning and painting shall conform to the applicable requirements of Sections 12 and 13 as modified herein.

SMALL CLEANING AND PAINTING SCHEDULE

Description of Surface	Cleaning and Painting System Required
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existing steel paint surfaces damaged by construction operations	1-c
existing painted or bare surfaces exposed by removal of materials	1-c
new galvanized materials outside the substation (including conduit)	11-b
new exterior and metal barriers in substation	1-d
new steel not otherwise covered in this general note	1-c
Cleaning systems in the steel cleaning and painting schedule are: I, sandblast cleaning or equal as approved by the Engineer; II, steam cleaner.	
Painting systems in the steel cleaning and painting schedule are as follows:	

- Barbed wire: one coat G-52, two coats G-53, additional coats G-53 as required to provide a minimum elapsed time between coats of G-53 of six weeks and; after erection: one coat coat of G-53 and one coat G-60. At the Contractor's option, system b may be used.
- After erection: one coat G-52, two coats G-53, and additional coats of G-53 as required to provide a minimum elapsed time between coats of G-53 of six weeks, and one coat G-60.
- One coat G-52, not less than two coats G-53, and one coat G-60.
- One coat G-52 and two coats G-53 pigmented to match ASA No. 61, light gray or at the Contractor's option, a factory applied baked enamel finish ASA No. 61, light gray, applied to sandblasted and phosphatized surfaces may be used.

Paints designated under painting systems above, are as follows:

- G-52 is pretreatment vinyl wash primer, State Specification 54-G-52.
- G-53 is paint, primer, red lead, semi-quick drying, State Specification 54-G-53.
- G-60 is aluminum paint finish coat, State Specification 54-G-60.
- G-32 is enamel, synthetic, ash and trim, State Specification 54-G-32.

CLEANING AND PAINTING (Cont'd)

- Paint, if sprayed on, shall be brushed out around rivets and bolt heads and exposed edges to avoid bridging over crevices and to insure even paint coats of the specified thickness.

Luminaire glassware and exposed parts of the housing of State-furnished sodium vapor luminaires shall be cleaned by washing with detergent and water and blown dry with compressed air.

Full compensation for all cleaning and painting required as shown on the plans and as specified will be included in the unit and lump sum prices paid for the various bid items.

ELECTRICAL WORK

- Electrical work shall conform to the requirements of Sections 60 and 61 as modified. Welding shall conform to the applicable requirements of Section 67.

- All ferrous fastenings and supports, except stainless steel, shall be hot-dip galvanized. Full compensation for galvanizing required for electrical work will be considered as included in the unit prices paid for the various bid items of work.

- The Contractor shall furnish and install all ferrous and non-ferrous fastenings, supports, clamps, anchors, and all other such devices required to provide conduit, cable, and wire complete in place and in operable condition as shown on the plans and specified and full compensation therefor will be included in the unit and lump sum prices paid for the various bid items requiring such work, except that channel type supports will be measured and paid for under Bid Item 4, miscellaneous details.

The interior of all conduit shall be clean before installation of cable or wire. Full compensation for required cleaning will be included in the price paid per linear foot for the cable or wire to be installed.

- The Contractor shall furnish and install an approved insulating material between dissimilar metals to prevent galvanic action.

- Full compensation for all additional labor and materials not shown on the plans or called for herein and for furnishing and installing materials shown on the plans but not covered under specific bid items and which are necessary to provide the electrical work complete and in satisfactory operating condition will be considered as included in the prices paid for the electrical work or unless otherwise specified, no additional compensation will be allowed therefor. The use of State-furnished materials does not relieve the Contractor of his responsibility to provide the electrical systems complete and in satisfactory operating condition.

- New materials and equipment in electrical work furnished by the Contractor shall match existing materials in the project.

- Neoprene or polyurethane, wherever required, shall be formulated to withstand long term compressive stresses and exposure to sunlight, ozone atmosphere, gasoline and oil fumes, and shall be an effective protection against electrolytic action between dissimilar metals. The ambient temperature in the approximate range 30°F. to 110°F.

- The Contractor shall furnish and install bond wire and grounding fittings complete in place in accordance with the requirements of Section 60, Chapter 11, and full compensation therefor will be included in the unit and lump sum prices paid for the various electrical bid items.

- Cleaning and painting of electrical work, where required, shall conform to the requirements of Sections 12 and 13 except that full compensation therefor will be included in the unit and lump sum prices paid for the various electrical bid items.

- Full compensation for drilling holes in structural steel, other metals, and concrete (except as provided under Bid Item 3), removing rivets, and raising rivet holes, will be included in the unit and lump sum prices paid for the various bid items requiring such work.

- Existing electrical systems and other utilities shall be maintained in operable condition equivalent to the condition of the existing system at the time construction is begun, and full compensation for such maintenance, including the installation and removal of necessary facilities required to provide uninterrupted services will be included in the unit and lump sum prices paid for the various bid items.

USE OF STATE-OWNED TRAVELER SCAFFOLDS

- Due to controlling traffic conditions, space available on the lower deck of the Bridge to perform the work under this contract is limited to the curb lanes as specified.

The Contractor should so plan the removal of existing luminaires and the erection of new luminaires and appurtenant equipment that use is made of the existing overhead traveler rail system for any suspended traveling scaffold the Contractor may provide as a working platform.

Three State-owned traveler scaffolds presently located on the west bay steel spans will be available for use on this contract when not required by bridge maintenance forces.

Three State-owned traveler scaffolds presently located on the east bay steel spans and one State-owned traveler scaffold presently located on the west bay steel spans will be available for use on this contract when they are no longer needed for work under Contract No. 4030 and when not required by bridge maintenance forces.

The Contractor shall arrange for use of State-owned traveler scaffolds or the overhead traveler rail system with the Engineer and such use will be subject to the following requirements:

- The operation of traveler scaffolds shall be by operators experienced in the use of such equipment.
- Whenever the Contractor in the progress of his work needs a State-owned scaffold used by the maintenance or other contractors' forces, he shall trade it for the least of his time, transfer materials and equipment from one to the other, and get both scaffolds into the condition suitable for the changed occupancy and use. The transfer shall be accomplished with the least possible interference with maintenance operations.
- The State will furnish the Contractor extension beams, hangers, and accessories required in moving the scaffolds across expansion joints. This material shall be returned to the State in good condition immediately following each use.

4. The State-owned traveler scaffolds and the traveler rail system were designed to be used for maintenance purposes. Their use for performing the work of this contract shall be without adaptation or modification. Therefore, it shall be the Contractor's responsibility to determine the capacity of the State-owned traveler scaffolds and the existing traveler rail system and to design and construct any additional alterations required thereon to insure their safety under any loads that may be imposed upon them, to construct any other structural, mechanical, electrical, or other alterations required in the performance of the contract work, and to repair and maintain the scaffolds in operable condition during the contract period. Upon completion of the work, the traveler scaffolds shall remain in place at locations designated by the Engineer and the Contractor shall restore the traveler scaffolds and traveler rail system to a condition suitable for maintenance use as approved by the Engineer. Furnishing all materials and doing all work required to move and adapt the scaffolds and adapt the traveler rail system as required will be considered to be for the Contractor's convenience and full compensation therefor will be included in the unit and lump sum prices paid for the various bid items of work.

5. Detailed plans of modifications of State-owned traveler scaffolds and of the traveler rail system and construction details of all other scaffolds which will be used by the Contractor together with proposed loadings and procedure of use shall be submitted to the Engineer for approval.

SAN FRANCISCO-OAKLAND BAY BRIDGE RECONSTRUCTION LOWER DECK LIGHTING

CONTRACT WORK - BID ITEMS 1 TO 5

MARK	DATE	DESCRIPTION	BY	CHK
		As built with revisions	L.S.	RAB

SCALE	NONE	BRIDGE	33-25 34-03 34-04	SHEET NO.	2	DRAWING	G-1027-28
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NO.	BID ITEM	QUAN.	UNIT	DESCRIPTION
6	fluorescent luminaire lighting installations, Type WD.	146	each	<p>Shall conform to the requirements of Sections 31, 60, and 67 and shall consist of furnishing and installing fluorescent luminaires, hangers, electrical and structural connections, and all other materials required to provide the luminaire installations complete in place and in operating condition, including cleaning and painting.</p> <p>Luminaires shall include luminaire beams, cast and machined aluminum lamp socket housings, pedestals, and connection boxes, socket assemblies, reflectorized fluorescent lamps, ballasts, 1/2-inch aluminum conduit with supports and fittings, secondary wiring, and other materials as shown on the plans, and shall conform to the following requirements:</p> <p>Luminaire beams shall be aluminum extrusions conforming to the Aluminum Association specification for Alloy 6061-T6.</p> <p>Lamp sockets shall be Klaco, Type US-60 spring loaded, or equal, with the Underwriters' Laboratories label for outdoor installations, weatherproof, vibration proof, and with positioning marks.</p> <p>Fluorescent lamps shall be 96-inch, 800ma rapid start, reflector type as manufactured by Sylvania Electric Products, Inc., Type P96-T12/CM/NO/APL, or equal.</p> <p>Ballasts shall be Jola Electric Company outdoor weatherproof units, Types No. 674-116 and 674-152, or Advance Transformer Co. (1) P60T12/NO, Catalog No. 202 1-110-70, Dimension M-2 and (2) P60T12/NO, Catalog No. 202 2110-70, Dimension M-2, or equal, 140 volts with minimum starting temperatures of -20° F. and of high power factor, in accordance with Certified Ballast Manufacturing Standards and A.S.A. Specifications Nos. C82.1, C82.2, and C82.3.</p> <p>Luminaire secondary wiring shall be color coded and installed completely in place during fabrication.</p> <p>Fastenings shall be stainless steel, Type 302 or 304. All screwed fastenings shall be secured with shaperoof devices. Where metallic surfaces other than aluminum are in contact with aluminum, insulation and corrosion control shall be provided.</p> <p>Luminaire hangers shall include luminaire clamps, structural shapes, beam clamps, concrete expansion shields, neoprene washers, connectors and other materials shown on the plans and shall conform to the following requirements:</p> <p>Luminaire clamps shall be aluminum extrusions conforming to the Aluminum Association specification for Alloy 6061-T6.</p> <p>Concrete expansion shields shall be 1/2-inch self drilling Phillips Head flush type anchors, or equal.</p> <p>All ferrous materials shall be hot-dip galvanized after fabrication.</p> <p>The Contractor shall furnish one prototype Type WD luminaire, condenser distribution curves and brightness measurements as described by Illuminating Engineering Society Guides, evidence showing that luminaires will start and restart with upstare and condenser substancer on lamps at 33° F. to 40° F., and results of voltage test showing that luminaires will remain illuminated through 3,000,000 cycles using a waveform of not less than 1/2-inch in at least two directions. The prototype luminaire, and all test data and measurements, shall be submitted to the Engineer for approval before any work is started. The vibration test shall be carried out at between 150 - 300 cycles per minute. Full compensation for providing the prototype luminaire and performing such tests will be included in the unit prices paid for Bid Items 6 to 10.</p> <p>Extruded aluminum luminaire beams and luminaire clamps shall have a satin finish.</p> <p>Primary entries of Type LF cable for Types WD, ED, and ET fluorescent luminaires tap connections shall be provided with terminal screw terminals, GE Electric Mfg. Co., Inc., Type Fx, or equal.</p> <p>The Contractor shall furnish and use a magnetic detector for determining the location of buried reinforcing steel in concrete before drilling holes for the installation of hangers for Type CS and Type CD lighting installations.</p> <p>Lamps shall be rotated into the position determined by the Engineer to provide the most even illumination of the roadway surface.</p> <p>The Contractor shall furnish one spare lamp for each lamp installed. Spare lamps shall be stored in the Division's warehouse on the East Bay Mills. Full compensation for furnishing and storing spare lamps will be included in the unit prices paid for Bid Items 6 to 10.</p> <p>All exposed surfaces of the luminaires and luminaire clamps shall be cleaned and painted with an epoxy paint system conforming to the applicable requirements of Sections 32 and 33 and the following:</p> <p>The surfaces to be painted shall be thoroughly cleaned of all dirt, oil, grease, or other deleterious substances and given a pretreatment acid wash. (State Specifications 52-1-05), one coat of an epoxy primer and an epoxy finish coat.</p> <p>The primer shall conform to the requirements of Military Specification MIL-P-52192.</p> <p>A finish coat consisting of an amine cured epoxy paint such as Nitro-Dur, Kato Pontex, or Devran Chemfast 500, or equal, or polyamide cured epoxy paint such as Sponal 91(310), or Devran Chemfast 600, or equal, will be considered as meeting the requirements of Sections 32 and 33.</p> <p>The finished epoxy paint system shall have a dry film thickness of not less than 5 mils, and shall be a highly reflective glossy off-white conforming to Federal Specification No. 595, Color 17846. The epoxy coating on the ballast shall be air-dried.</p> <p>Three-quarter inch conduit and #6 TW wire for primary circuits on Types ET and double ED fluorescent luminaires will be measured and paid for under Bid Items 13 and 16 respectively.</p>
7	fluorescent luminaire lighting installations, Type ED.	178	each	
8	fluorescent luminaire lighting installations, Type ET.	92	each	
9	fluorescent luminaire lighting installations, Type CS.	15	each	
10	fluorescent luminaire lighting installations, Type CD.	62	each	

NO.	BID ITEM	QUAN.	UNIT	DESCRIPTION
11	installing State-furnished pole mounted sodium vapor luminaires.	8	each	<p>Shall consist of installing State-furnished sodium vapor luminaires and lamps on existing poles and State-furnished isolating transformers in existing sidewalk boxes making all electrical and structural connections; and furnishing and installing mast arms, hanger brackets, 1 1/2-inch flexible conduit drip loop and fittings, and all other materials required to provide the lighting installations complete in place and in operating condition, including cleaning and painting.</p> <p>Mast arms shall be mild-steel No. 6-256-15-2 or equal.</p> <p>Mast arms, hanger brackets, and their fastenings shall be hot-dip galvanized after fabrication.</p> <p>Furnishing and installing wiring between the isolating transformer and luminaire will be measured and paid for under the bid item for each work.</p> <p>The longitudinal centerline of the mast arm shall be installed perpendicular to the centerline of the roadway as seen in a plan view.</p>
12	threadless junction box installations between bents 21 and 41.	40	each	<p>Shall consist of furnishing and installing complete in place threadless junction boxes, malleable iron covers, gaskets, and bell recovery for 1 1/2-inch diameter conduit; including sectioning existing 1 1/2 inch conduit to accept threadless junction boxes.</p> <p>Junction boxes shall be Type RT, 1 1/2 inch No-Thread Regal Conduit Boxes, Catalog No. 12221, covers shall be Catalog No. 12-60 with gaskets as manufactured by the Appleton Electric Company, or equal. Boxes and covers shall be cadmate finished.</p> <p>Threadless junction boxes installed under this bid item are to provide branch circuit connections to Types CS and CD fluorescent luminaire installations between bents 21 and 41.</p>
13	3/4-inch diameter galvanized rigid steel conduit.	1,057	linear feet	<p>Shall conform to the requirements of Section 60 and shall consist of furnishing and installing complete in place, including cleaning and painting, all 3/4-inch and 1 1/2 inch rigid conduit required for the work.</p> <p>All bends in conduit shall have not less than the radius specified in Table 346-10 of the NEC for conductors with lead sheathing, unless otherwise shown on the plans, or unless larger radius bends are required to conform to the requirements of the IPCEA Standards for pulling cable under tension.</p> <p>Drilling will be measured under this item. Full compensation for furnishing and installing all fittings, supports, clamps, and other materials required to provide the conduit connections in place will be included in the unit prices paid for conduit. Each joint, connection, and pull boxes with any inside diameter of six inches or greater, and channel type supports will be measured and paid for under Bid Item 4, miscellaneous details.</p> <p>Drilling 3-in 2 holes in concrete for the installation of 1 1/2 inch conduit will be measured and paid for under Bid Item 3.</p>
14	1 1/2 inch diameter galvanized rigid steel conduit.	2,221	linear feet	<p>Shall conform to the requirements of Section 60 and shall consist of furnishing and installing complete in place, including cleaning and painting, all 1 1/2 inch rigid conduit required for the work.</p> <p>Drilling will be measured under this item. Full compensation for furnishing and installing all fittings, supports, clamps, and other materials required to provide the conduit connections in place will be included in the unit prices paid for conduit. Each joint, connection, and pull boxes with any inside diameter of six inches or greater, and channel type supports will be measured and paid for under Bid Item 4, miscellaneous details.</p> <p>Drilling 3-in 2 holes in concrete for the installation of 1 1/2 inch conduit will be measured and paid for under Bid Item 3.</p>
15	installing State-furnished 5-WV street lighting cable.	8,204	linear feet	<p>Cable and wiring materials, construction, and tests, unless otherwise noted or subsequently specified shall conform to the requirements of the IPCEA Standard S-19-61, Third Edition, March 1959, "Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy," and IPCEA Standard S-61-62, July 1961, "Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy," and the Association of Edison Illuminating Companies "Solid-Type Impregnated Paper Insulated, Lead-Covered Cable Specifications," Fifth Edition, and its subsequent amendments or additions. All cable and wiring materials shall be as manufactured by the Associated Wire and Cable Company, Construction Materials Division of the General Electric Company, the Granite Company, Stone Cable Corp., the Simplex Wire and Cable Company, or equal.</p> <p>All tests as specified in the aforementioned regulating agencies and herein shall be made, certified, and admitted for approval for Types LT and L cable. Samples and supplemental data shall be submitted for all cable and Type TV wiring materials demonstrating that these meet the specifications.</p>
16	one-conductor, #6 AWG, TV wire.	9,530	linear feet	<p>All the above information shall be submitted in triplicate for the Engineer's approval; and any material purchased, labor performed, or delay to the work prior to approval shall be the liability of the Contractor.</p>
17	one-conductor, #12 AWG, TV wire.	3,794	linear feet	<p>Where polyethylene is specified, the insulation material used shall be E. I. DuPont de Nemours &amp; Co., Inc. Alkathen 3 HEC-10 or equivalent HEC 6005 or equal. The thickness of polyethylene insulation shall be not less than 97 percent of the nominal thickness and shall be concentric around the conductor as shown on the plans. No additions shall be permitted in the construction of the insulation of polyethylene insulated cables. The thickness of polyvinyl chloride jacket shall be not less than 95 percent of the nominal thickness, and shall be concentric around the conductor or cable conductors as shown on the plans.</p>
18	two-conductor, #6 bronze armored cable, Type IT.	31,942.6	linear feet	<p>Armor, where specified, shall be an interlocking type of bronze armor with a tensile strength of not less than 80,000 psi and shall be of commercial bronze of uniform cross section and free from defects. The width and thickness shall be as required by ASTM Specification B-15-1948. Bronze interlocking armor shall be applied by such means as will insure tight fitting and firm contact between the armor and underlying material and shall be applied helically so that there will be a minimum overlap of 50 percent. Continuously welded corrugated bronze armor consisting of cables manufactured by the Simplex Wire and Cable Co., or equal, will be accepted as equal to the bronze interlocked armored cable.</p>
19	three-conductor, #6 bronze armored cable, Type L.	22,024.4	linear feet	<p>All cable and wire installation work, pulling, splicing, and terminating operations shall be performed. In the presence of the Engineer, information and necessary drawings for all such operations shall be submitted to the Engineer for approval before actual installation. Where cable ends are to be left dormant, a water-tight seal shall be applied to the ends and a sufficient length of cable left to make future splices. Splices shall be located in junction boxes or manholes.</p> <p>Prior to completion and acceptance of the work, the following tests shall be made on all cable and wiring installations in the presence of the Engineer: continuity of each circuit; check for grounds in each circuit; megger each circuit; megger circuit and ground-insulation resistance shall not be less than the values specified in Section 1119 of the National Electrical Code functional tests in which it is demonstrated that each</p>

NO.	BID ITEM	QUAN.	UNIT	DESCRIPTION
15	through 19 (continued)			<p>and every part of the wiring system functions as the system intended; an applied high voltage D.C. test to the 5-WV street lighting cable installed equivalent to 80 percent of the comparable factory test.</p> <p>All Types L and LT cable shall be manufactured on process reels and delivered on shipping reels whose minimum dimensions do not permit the cable to be bent less than the radius shown in Appendix F and G of the respective IPCEA references indicated above.</p> <p>Wire shall conform to the requirements of IPCEA Specifications S-19-61 and S-16-602. All type TV wire shall be manufactured as required by Column B, Table 1, Appendix 1 of the IPCEA Standard and shall meet Machine Tool Electrical Standards. All No. 6 AWG wire and larger shall be stranded. Type TV wire shall be color coded as follows: phase A, black; phase B, red; and phase C, blue.</p> <p>Cable and wire will be measured in a straight line along the slope from center to center of splice, bend, junction, or termination. Full compensation for splices will be included in the unit prices paid for bid items under which wire and cable work is required.</p> <p>Wire and cable of sizes not shown in the list of bid items will be required for work in the substations. Full compensation for furnishing and installing such wire and cable will be included in the lump sum price paid for Bid Item 20. Furnishing and installing #2, AWG, TV wire at Plan 122 will be measured and paid for under Bid Item No. 16, by verbal agreement.</p>
20	Miscellaneous electrical work.	Lump Sum		<p>Shall consist of:</p> <ol style="list-style-type: none"> <li>Furnishing and installing grounding transformers, current transformers, circuit breakers, and ground fault indicating relays in the Sterling Substation, Pier 29 Substation, Yerba Buena Island Substation, Pier 29 Substation, Hole Substation, and Substation No. 5; furnishing and installing metal cabinet barriers in the Pier 29 Substation, Yerba Buena Island Substation, and Pier 29 Substation; furnishing and installing Panel 1 cabinet including doors and lowered front cover in Substation No. 5; altering existing cable troughs in Substation No. 5; and including furnishing and installing grounding transformer phase wiring, installing State-furnished 480-volt neutral and equipment grounding wire, conductors, making all splices and connections, and remounting circuits.</li> <li>Opening existing Type L cable on the lower deck including cutting the cable, separating conductor ends, and installing in termination boxes. Termination boxes will be measured and paid for under Bid Item 4, miscellaneous details.</li> <li>Remembering circuit designations and installing new name plates in Substation No. 1 (S.F. anchorage).</li> <li>Reconnecting circuits on the Terminal Loop and on the bridge. New wire required for reconstructions will be measured and paid for under the respective bid items for wire and cable.</li> <li>Cleaning and painting materials installed under this bid item.</li> </ol> <p>Grounding transformers shall be Westinghouse or equal, three phase, six leg auto-connected, ten second, dry type DT-3, with rating for 500-KVA station transformer and 5 percent impedance in the Sterling substation, all others shall be rated for 300 KVA station and 5 percent impedance. Grounding transformers shall have Group II insulation with temperature rise not exceeding 80° C. or Group III insulation with temperature rise not exceeding 120° C. under full load in a maximum ambient of 40° C. Transformers shall have a minimum of 10 percent overload capacity at rated voltage.</p> <p>Current transformers for all substations shall be Westinghouse Type CT-2-F, Catalog No. 1435492, or equal, with 100 amp primary, 250 A-3P, 1A frame and 400 A-3P 1A frame circuit breakers shall have interchangeable trip units and shall have interrupting ratings by Underwriters' Laboratories of 10,000A at 600 volts AC and 250 volts DC; rms symmetrical RMS interrupting ratings shall be 50,000A at 240 volts AC, 35,000A at 480 volts AC, and 25,000A at 600 volts AC.</p> <p>Ground fault indicating relays shall be Westinghouse Type CO-9, Catalog No. RT 12-2889561A16, or equal, with Indicating Contactor Switch (ICS) and Indicating Instantaneous Trip (IIT). ICS shall have a range of 0.2-2.0 amps DC; IIT shall have a range of 20-80 amps AC.</p>

DATE APPROVED August 17, 1962

CCO 44  
Substituted an epoxy color and  
Armatured or polyamide cured  
paint system for the luminaires  
and luminaire clamps.

OFFICE OF SUPERVISOR  
DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

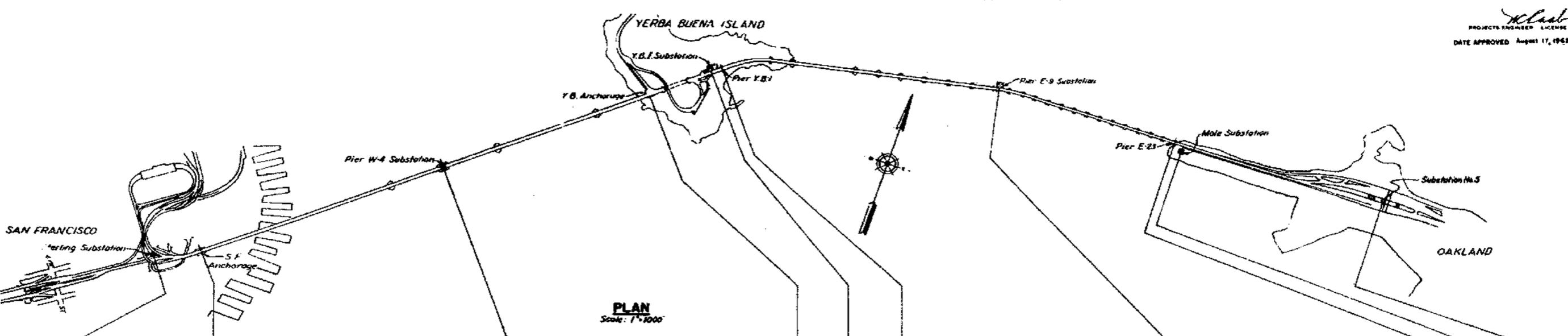
**SAN FRANCISCO-OAKLAND BAY BRIDGE  
RECONSTRUCTION  
LOWER DECK LIGHTING**

**CONTRACT WORK - BID ITEMS 6 TO 20**

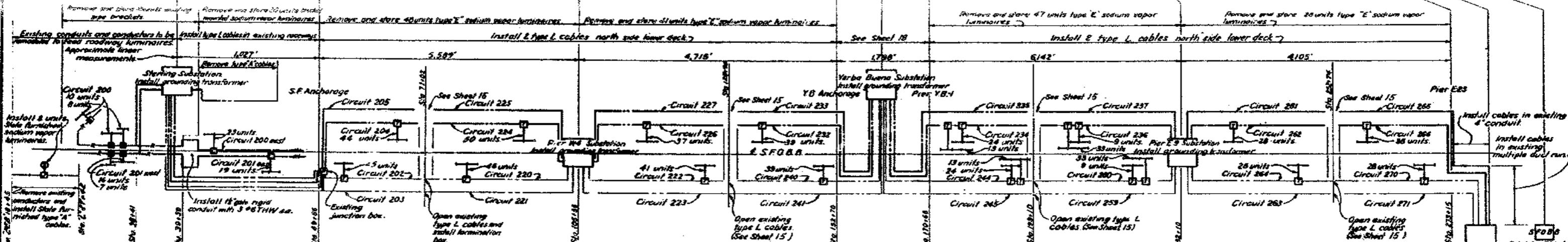
33-85  
34-03  
34-04

SCALE NONE BRIDGE SHEET NO. 3 DRAWING C-4027-38

MARK	DATE	DESCRIPTION	BY	CHK



**PLAN**  
Scale: 1"=1000'



**LOWER DECK ROADWAY LIGHTING DIAGRAM**  
Scale: None

- LEGEND**
- Existing rigid steel conduit.
  - Existing concrete encased multiple raceways.
  - Existing 1 1/2" conduit to be removed with seamless junction box.
  - Install 1 1/2" galvanized rigid steel conduit with #6TW wires in numbers as indicated by cross marks, unless otherwise noted.
  - Existing type L cable.
  - Install type L cable.
  - Install type A, type AZ, or type LT armored cable, as indicated.
  - Existing lower deck sodium vapor luminaires to be removed and stored as directed. (SFOBB Designation Type E)
  - Existing sodium vapor luminaires to remain.
  - Existing sodium vapor luminaires to remain to be reconditioned.
  - Install bracket sodium vapor luminaire.
  - Install single trap fluorescent luminaire.
  - Install double lamp fluorescent luminaire.
  - Install triple lamp fluorescent luminaire.
  - Existing sidewalk box and light pole.
  - Existing pull box.
  - Install seamless junction box.
  - Install top box.
  - Install threaded type junction box.
  - Install splice in 5 KY cable, types A, AZ or equal.
  - Install connections for type A cable of IL transformer.
  - Existing pipe bracket to be removed.

- GENERAL NOTES**
1. The major items of construction are:
    - a. To provide new roadway lighting installation on the lower deck.
    - b. To install two (2) type L, roadway lighting cable in north curb and handrail of lower deck and in Yerba Buena land utilities track curbs and raceways.
    - c. To remove existing roadway lighting installations of the lower deck.
    - d. To mount State-fluorescent sodium vapor luminaires on poles adjacent to San Francisco approach to lower deck.
    - e. To modify power distribution and to provide additional grounding facilities for Sterling, Pier W-4, Yerba Buena, Pier E-9, Male and No. 5 Substations.
  2. For information about removal and storage, see Note 5 on Contract No. 4 Bid Items 1 to 5 and Plan and Elevation - SFOBB Sta. 263+07 to Sta. 345+00.
  3. Expansion loops shall be developed in new cable installations of major expansion joints of the bridge. Expansion fittings shall be provided in conduit raceways for all structural expansion joints.
  4. Brady B-101 aluminum foil type wire markers shall be placed on all new or relocated conductors of terminations in the substations or where connections and terminations are made, except 3/8" brass tags shall be used in manholes, large vaults, or pull boxes. Such identification tags shall show circuit numbers.
  5. Luminaire installations shall be made with connections to alternate phases of related feeder (roadway lighting) circuits.
  6. For information concerning corrosion control between dissimilar metals, see Note 17, "Contract Work", Bid Items 1-5.



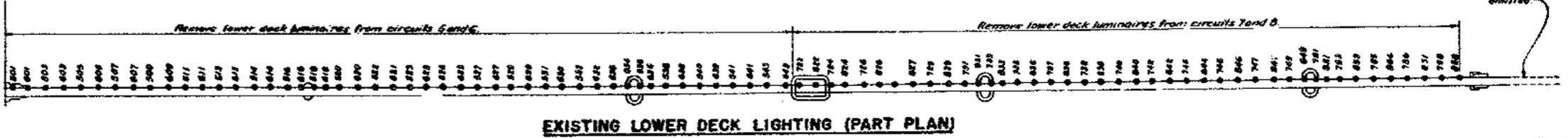
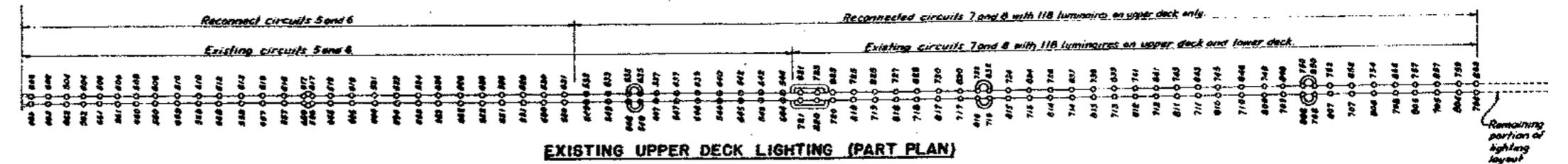
As built with revisions.	4/3/62
MARK/DATE	DESCRIPTION
	BY/CHK
	REVISION

STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

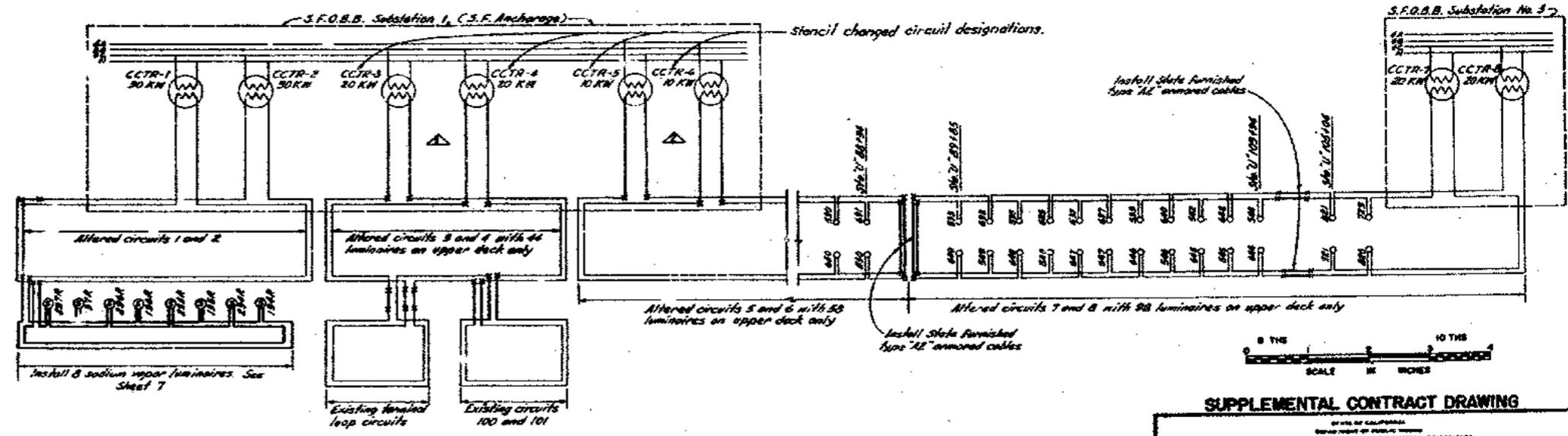
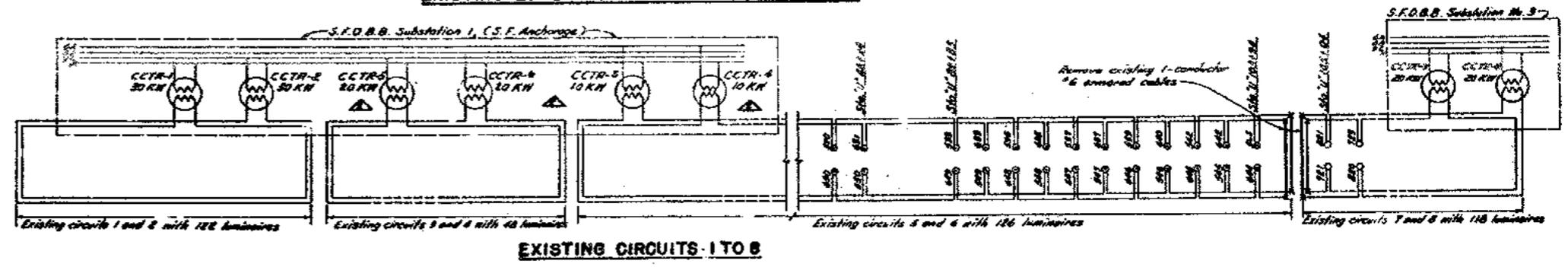
**SAN FRANCISCO-OAKLAND BAY BRIDGE  
RECONSTRUCTION  
LOWER DECK LIGHTING**

**GENERAL PLAN AND DIAGRAM**

SCALE AS SHOWN	BRIDGE	33-25 34-03 34-04	SHEET NO. 4	DRAWING C-4027-4R
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See Sheet No. 43, 44 and 45 for additional information pertinent to this sheet.



**SUPPLEMENTAL CONTRACT DRAWING**

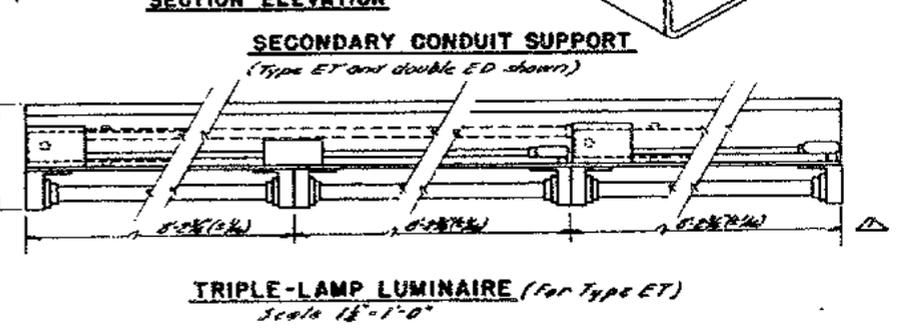
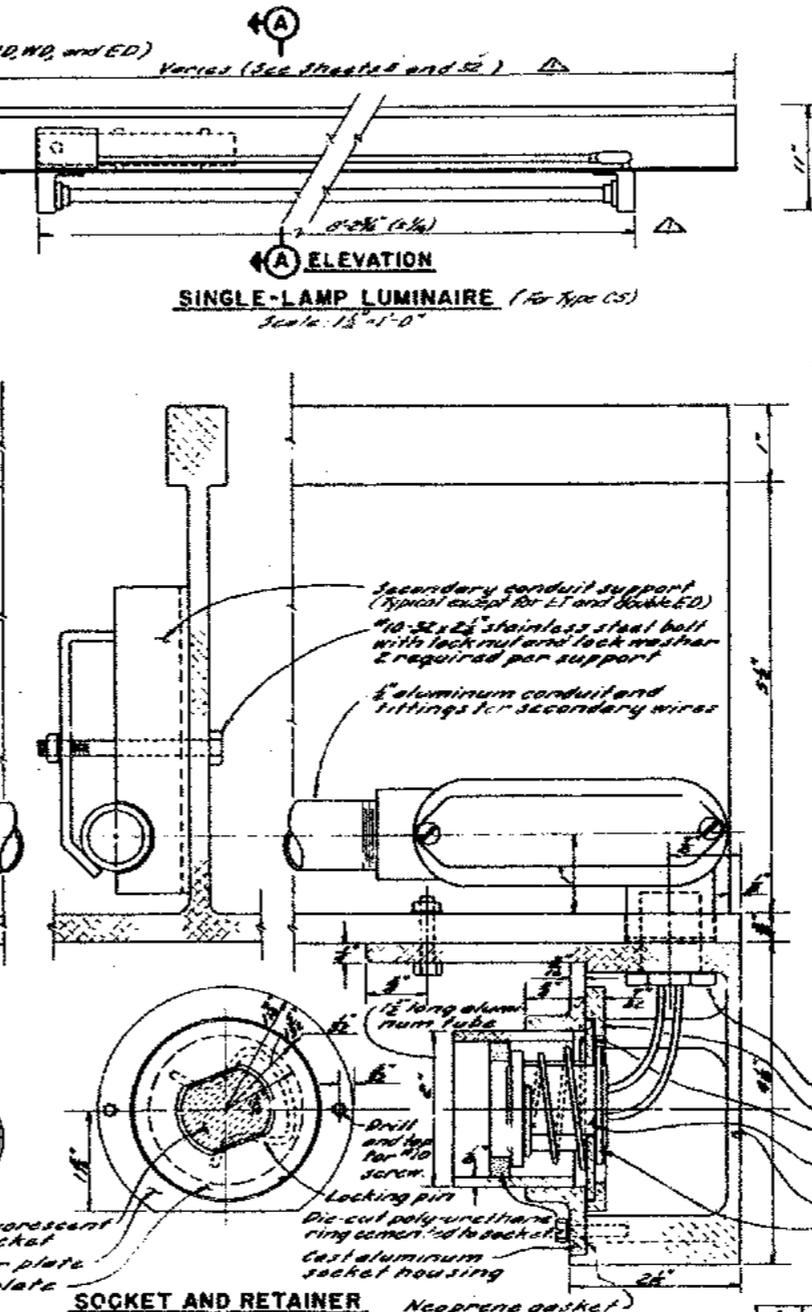
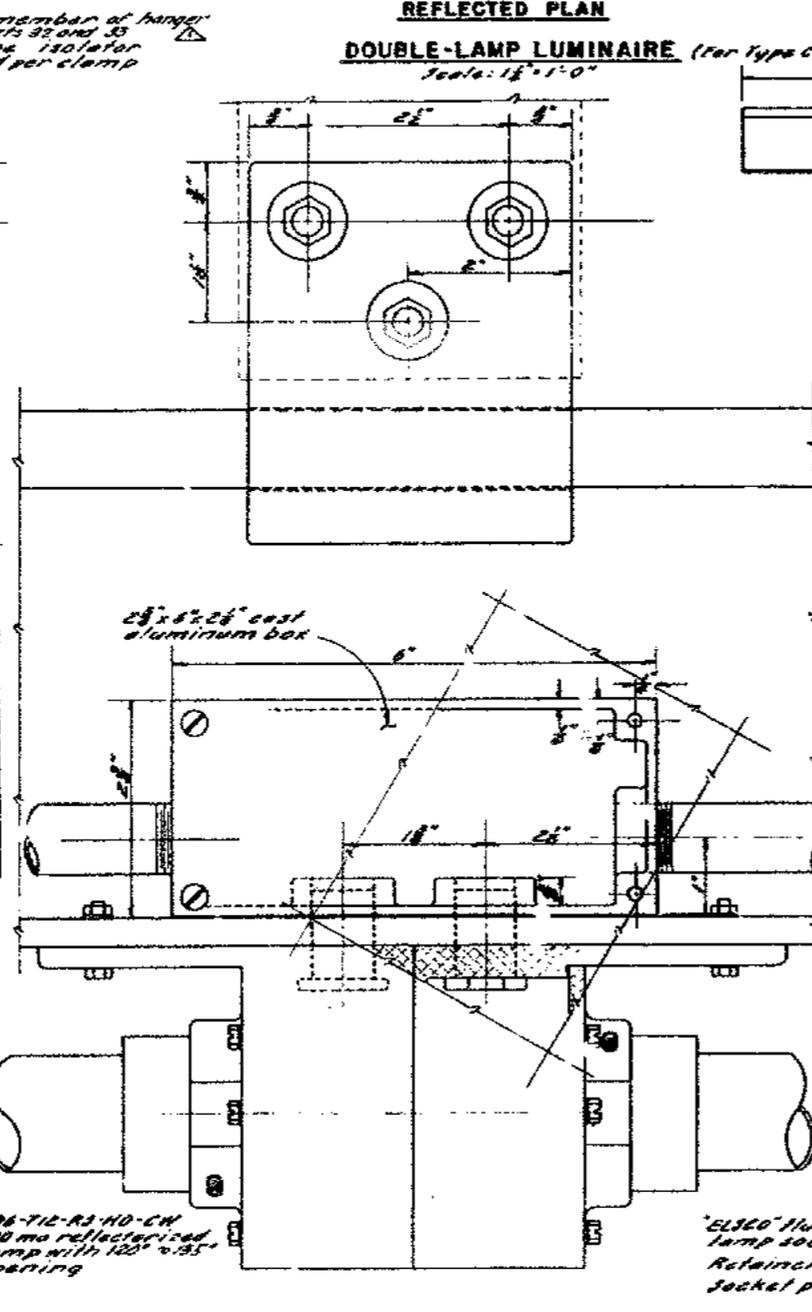
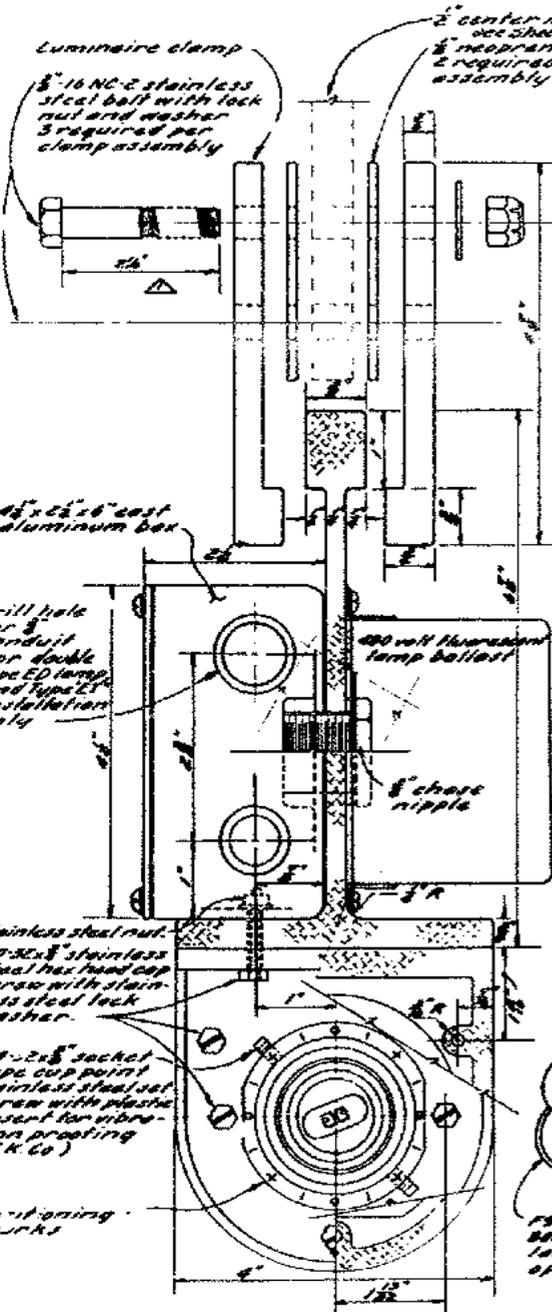
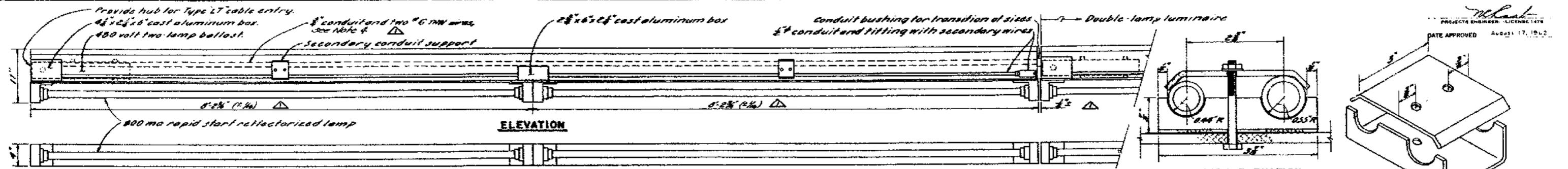
STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF SAN FRANCISCO BAY TOLL CHARGES

**SAN FRANCISCO - OAKLAND BAY BRIDGE  
 RECONSTRUCTION  
 LOWER DECK LIGHTING**

**SODIUM VAPOR LIGHTING ALTERATION**

SCALE NONE	BRIDGE 34-04	SHEET No. 5	DRAWING C-4027-5A
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NO.	DATE	DESCRIPTION	BY	CHKD.
1		As built with revision	CB	W.S.P.
2		Change wiring connections Terminal Loop Street Lighting	W.F.	L.B.



- NOTES**
- For particular detailed specifications of the Roadway Fluorescent Luminaires, see Sheet 5, Contract Mark and Items 8 to 20, the descriptions for Items 8 to 10 inclusive. Included among these requirements, the following information is noted:
    - Each luminaire shall consist of a continuous, extruded aluminum base (designated as luminaire base), luminaire lamp sockets, cast aluminum housings and pedestals, cast aluminum bases, aluminum conduit and fittings for secondary wiring, secondary wiring, ballasts, reflector type fluorescent lamps, and other material as shown.
    - The lamp sockets shall be weather proof, vibration proof, and "UL" approved for outdoor installation. Sockets shall permit rotation of lamp to fixed positions.
    - Ballasts shall be one or two lamp, 400-volt primary, outdoor weather proof units for 98 inch, 800 ma, fluorescent lamps.
    - All exposed surfaces of the luminaire and its associated clamps shall be cleaned and painted with an epoxy paint system to produce highly reflective, off white surfacing coating.
    - Before fabrication, one prototype luminaire and detailed shop drawings shall be submitted to and approved by the Engineer.
    - Test data demonstrating luminaire starting and restarting, vibration resistance, and photometric characteristics shall be submitted.
  - Where metallic surfaces other than aluminum are in contact with aluminum, isolation and corrosion control shall be provided.
  - Primary entries of Type ET, CD, WD, ED, and ET luminaires top connection shall be provided with bronze armor cable terminations, GE Electrical Mfg. Co. Inc., Type RG or equal.
  - 1/2 inch conduit and #6 MW wire for primary circuits on Type ET and double ED luminaires will be measured and paid for under bid items No. 13 and No. 14.
  - Luminaire type designations such as CS, CD, ED, WD, and ET are individual or combination of basic units as shown above with differences in hanger and mounting details:
 

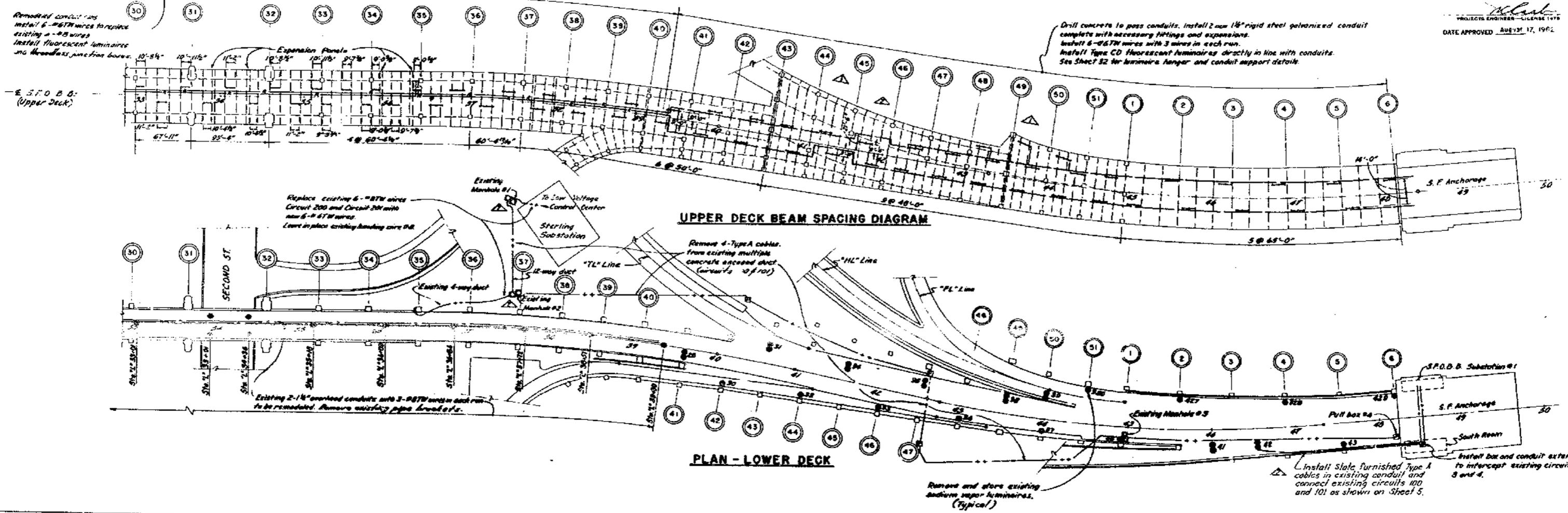
1. C - Concrete structure	4. S - Single lamp units
2. W - West Bay spans	5. D - Double lamp units
3. E - East Bay spans	6. T - Triple lamp units
  - For additional details see Columbia Lighting Drawing LP-9076-3 and LP-9100-C.



STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS			
<b>SAN FRANCISCO-OAKLAND BAY BRIDGE RECONSTRUCTION LOWER DECK LIGHTING</b>			
<b>ROADWAY FLUORESCENT LUMINAIRES</b>			
UNLESS NOTED SCALE FULL SIZE	33-25 1.05 BRIDGE 4.4	SHEET No. <b>6</b>	DRAWING C-4027-6R

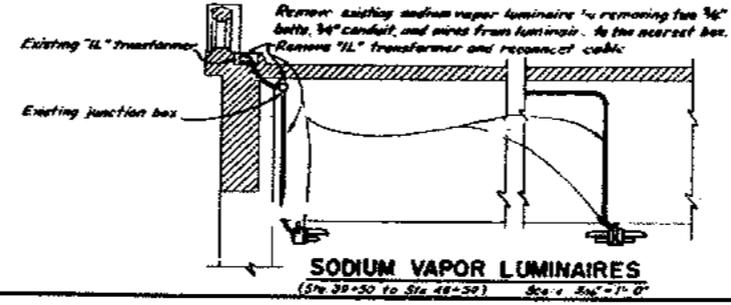
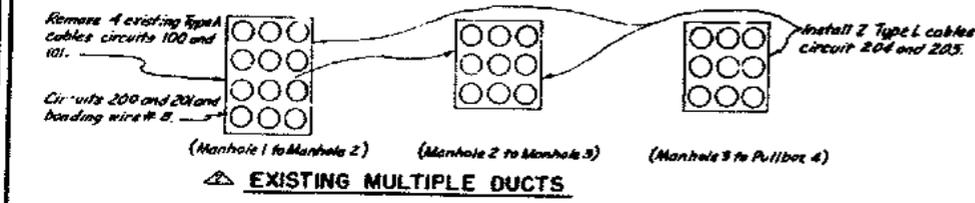
MARK	DATE	DESCRIPTION	BY	CHK
		As built with revisions	CC	MS
			CHW	





TABULATION OF QUANTITIES

NO.	DESCRIPTION	UNIT	STATION																													
			30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	1	2	3	4	5	6		
1	Remove electrical materials	Lbs.																														
2	Remove sodium luminaires	EA.	190		710	185	40	185	185	200	2850	115	103	103	104	75	63	63	23	182	64	191	67	75								
3	Drilling holes in concrete	L.F.	0	0	0	0	0	0	0	0	0	0	20	53	123	152	152	162	186	192	183	175	151	133	164	135	97	97	100	107		
4	Miscellaneous metal	Lbs.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5	Tap leads for Type L cables	EA.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6	Type CD luminaires	EA.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7	Type CD luminaires	EA.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8	Type CD luminaires	EA.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9	Type CD luminaires	EA.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10	Type CD luminaires	EA.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11	Type CD luminaires	EA.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
12	Type CD luminaires	EA.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
13	1 1/2 inch rigid conduit	L.F.	35.3	21.4	22.2	39.3	27.8	30.5	30.5	29.3	22.7	27.7	23.5	19.3	19.2	9.5	9.7	10.5	9.5	9.5	31.5	31.5	27.7	27.7	3.0	3.0	3.0	3.0	3.0	3.0		
14	1 1/2 inch rigid conduit	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
15	State furnished 3 KV cable	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
16	1 conductor #8 TW wire	L.F.	4080	5610	3630	3630	4320	7230	13260	7610	3004	3004	3004	3004	2863	3050	3260	3050	2860	2860	2860	2860	2860	2860	2860	2860	2860	2860	2860	2860		
17	Type L 2 conductor #8 cable	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
18	Type L 3 conductor #6 cable	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
19	Min. luminous electrical work	L.S.	0	0	0	0	0	0	2672	2902	101	101	101	101	115	98	98	98	98	3292	98	98	98	98	98	143.2	140	140	140	140		



\* Quantities for these bid items only have been revised at each panel point to agree with final "As built" quantities. Accumulated totals of all "As built" quantities are shown on Sheet No. 29.



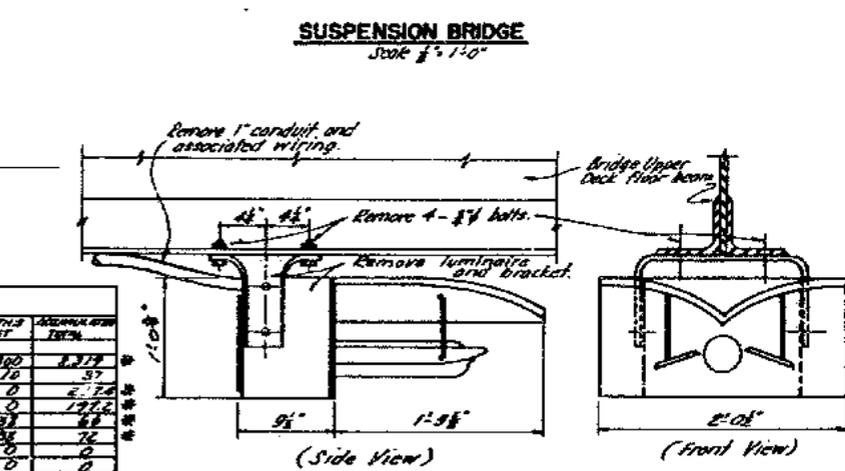
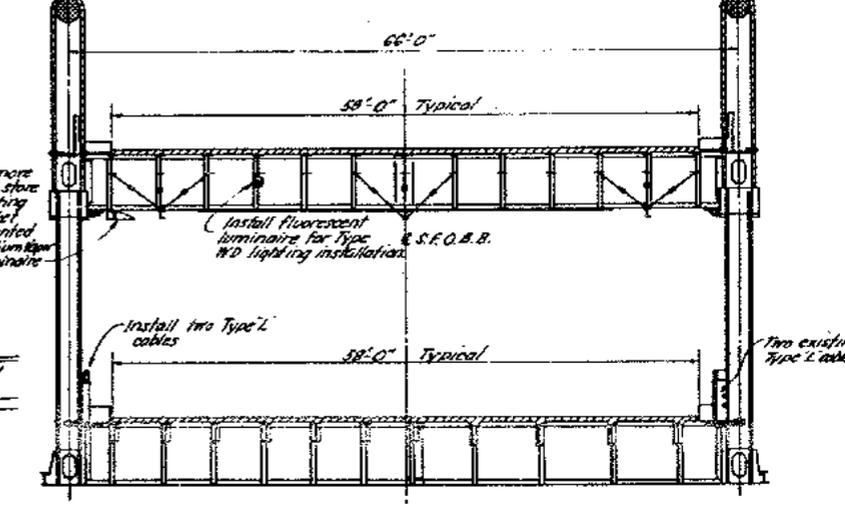
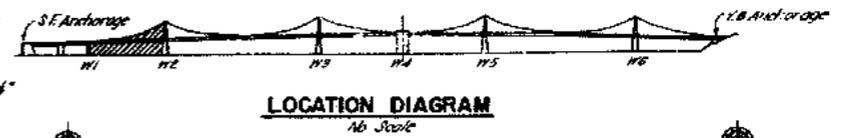
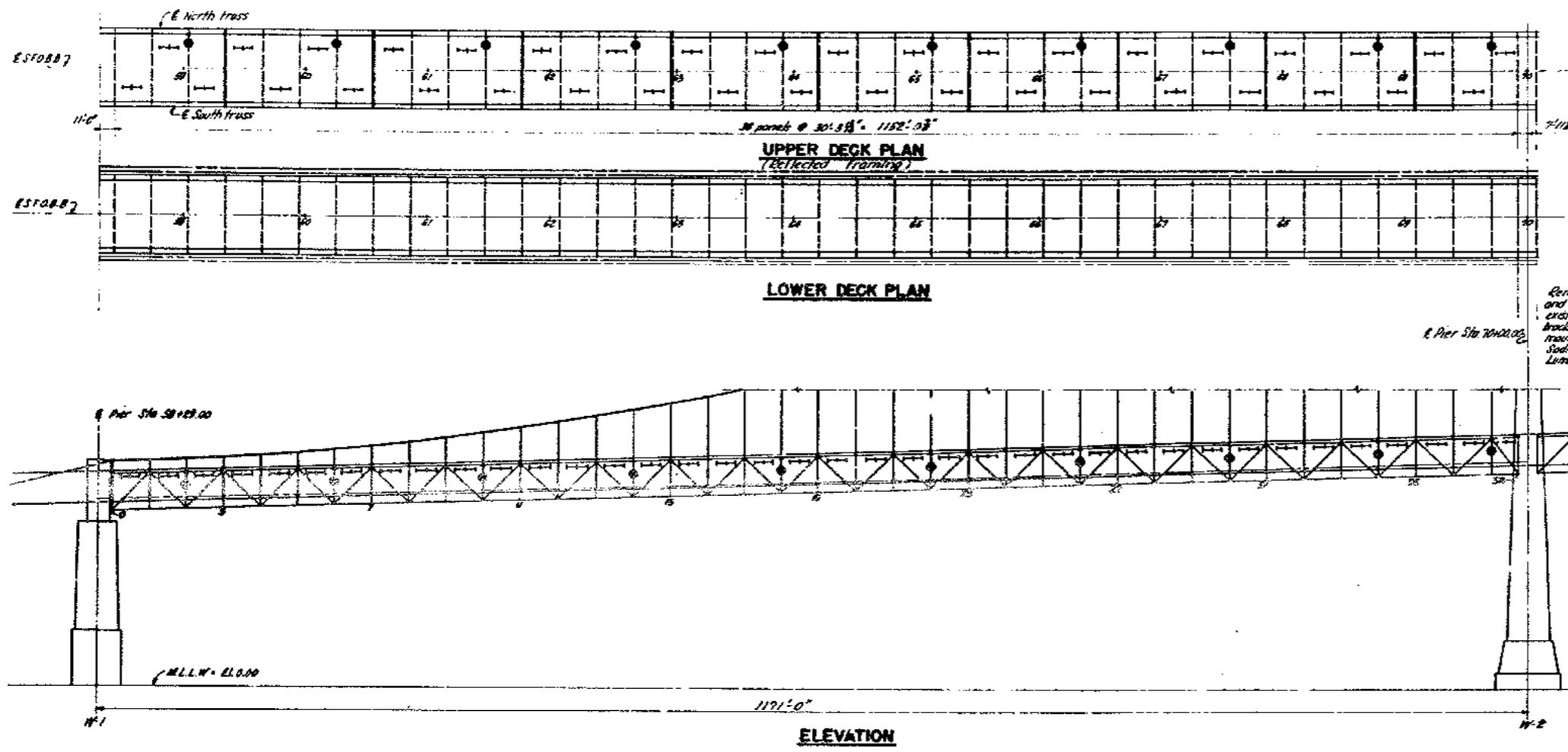
SUPPLEMENTAL CONTRACT DRAWING

SAN FRANCISCO-OAKLAND BAY BRIDGE RECONSTRUCTION LOWER DECK LIGHTING

PLAN - STA. 32+98 TO STA. 48+20

UNLESS NOTED	33-85		
SCALE 1" = 50'-0"	34-03		
BRIDGE 34-04		SHEET NO. 8	DRAWING C-4027-B





**TABULATION OF QUANTITIES**

PANEL POINT	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL THIS SHEET	MEMORANDUM TOTAL		
Remove electrical installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300	2,279	
Remove electrical accessories	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	57	
Remove metal boxes or enclosures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,174
Remove wiring in conduits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,772
Remove boxes for Type L cables	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	88
Type ED lighting installation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	38	76
Type ED lighting accessories	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Type EY lighting installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Type EY lighting accessories	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Type CD lighting installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Type CD lighting accessories	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
State furnished system luminaire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bracket	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Threadless junction box	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1/2 inch rigid conduit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1/2 inch rigid conduit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
State furnished S & T cable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1-conductor 16 AWG wire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1-conductor 14 AWG wire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Type L1 1-conductor 16 cable	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	7,419	
Type L1 1-conductor 14 cable	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	7,419	
Type L1 3-conductor 16 cable	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	7,419	
Type L1 3-conductor 14 cable	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	7,419	
Electromechanical mark	1.5																																		

\* Quantities for these bid items only have been revised at each panel point to agree with final "As Built" quantities. Accumulated totals of all "As Built" quantities are shown on sheet No. 29.

MARK/DATE	DESCRIPTION	BY	CHK.
	REVISION		

STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

**SAN FRANCISCO-OAKLAND BAY BRIDGE**  
RECONSTRUCTION  
LOWER DECK LIGHTING

**PLAN AND ELEVATION STA. 58+29 TO STA. 70+00**

UNLESS NOTED  
SCALE 1" = 50'

BRIDGE 33-25  
34-03  
34-04

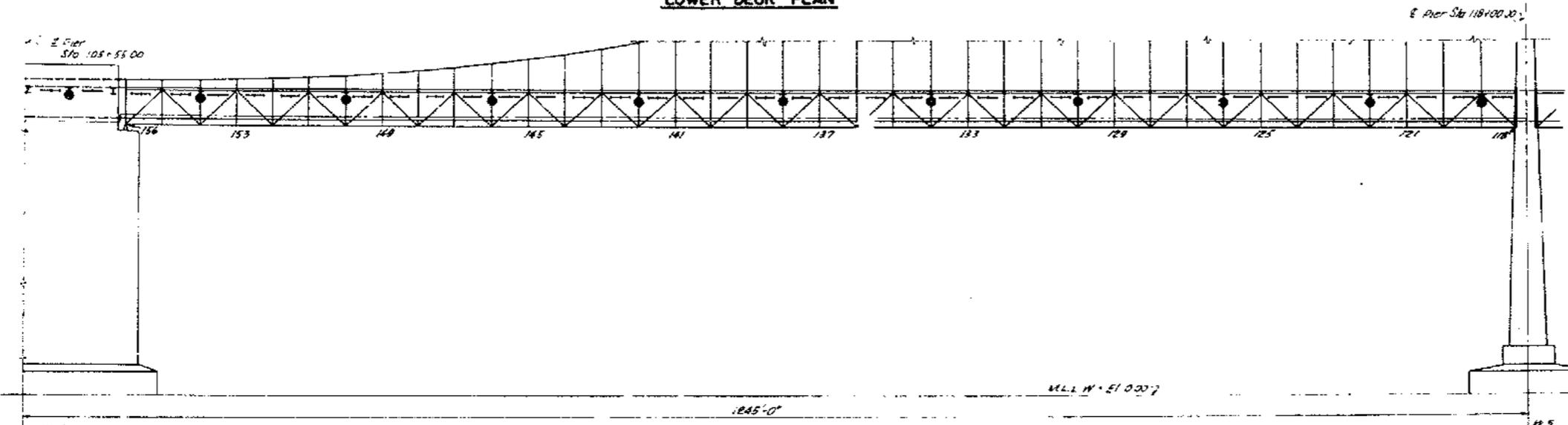
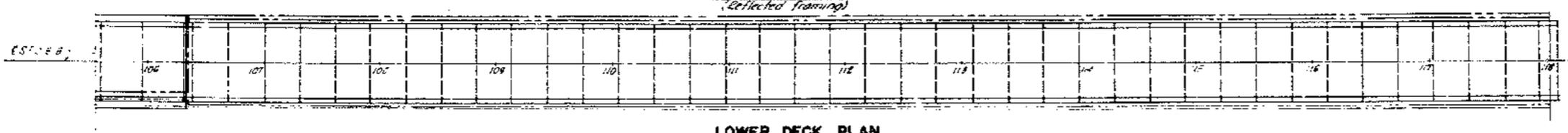
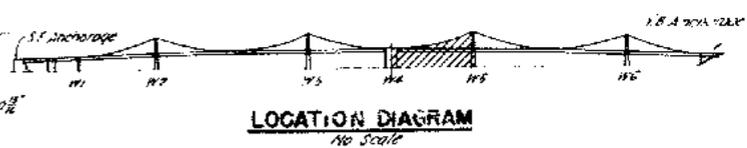
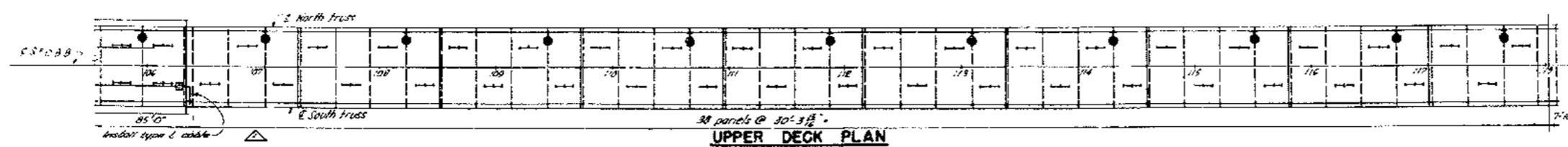
SHEET No. 10  
DRAWING C-4027-10A











TABULATION OF QUANTITIES

PANEL POINT	UNIT	106	107	108	109	110	111	112	113	114	115	116	117	118	TOTAL THIS SHEET	ACCUMULATED TOTAL
1. Remove electrical materials	Lbs	32	0	32	0	0	30	0	0	30	0	0	30	0	30	9,579
2. Remove galvanized laminations	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
3. Drilling holes in concrete	LF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2974
4. Miscellaneous metals	Lbs	173	44	0	0	0	0	0	0	0	0	0	0	0	0	4,902
5. Top bungs for type L cable	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	220
6. Type MD lighting installation	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
7. Type ED lighting installation	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. Type ET lighting installation	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Type CS lighting installation	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
10. Type CS lighting installation	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
11. State approved sodium laminaire	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12. Threadless junction box	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13. 1/2 inch rigid conduit	LF	136.0	0	0	0	0	0	0	0	0	0	0	0	0	0	136
14. 1/2 inch rigid conduit	LF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15. State approved 5 K.V. cable	LF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16. 1-conductor #6 TW wire	LF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17. 1-conductor #12 TW wire	LF	27.0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.0
18. Type LT, 8-conductor #6 cable	LF	0	52.0	49.0	52.0	49.0	52.0	49.0	52.0	49.0	52.0	49.0	52.0	49.0	52.0	1,491.0
19. 1/2" L, 8-conductor #6 cable	LF	150.0	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5
20. Miscellaneous electrical work	L.S.															

\* Quantities for these list items only have been revised at each panel point to agree with final "as built" quantities. Accumulated totals at all "as built" quantities are shown on sheet no. 13.



STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

**SAN FRANCISCO-OAKLAND BAY BRIDGE**  
RECONSTRUCTION  
LOWER DECK LIGHTING

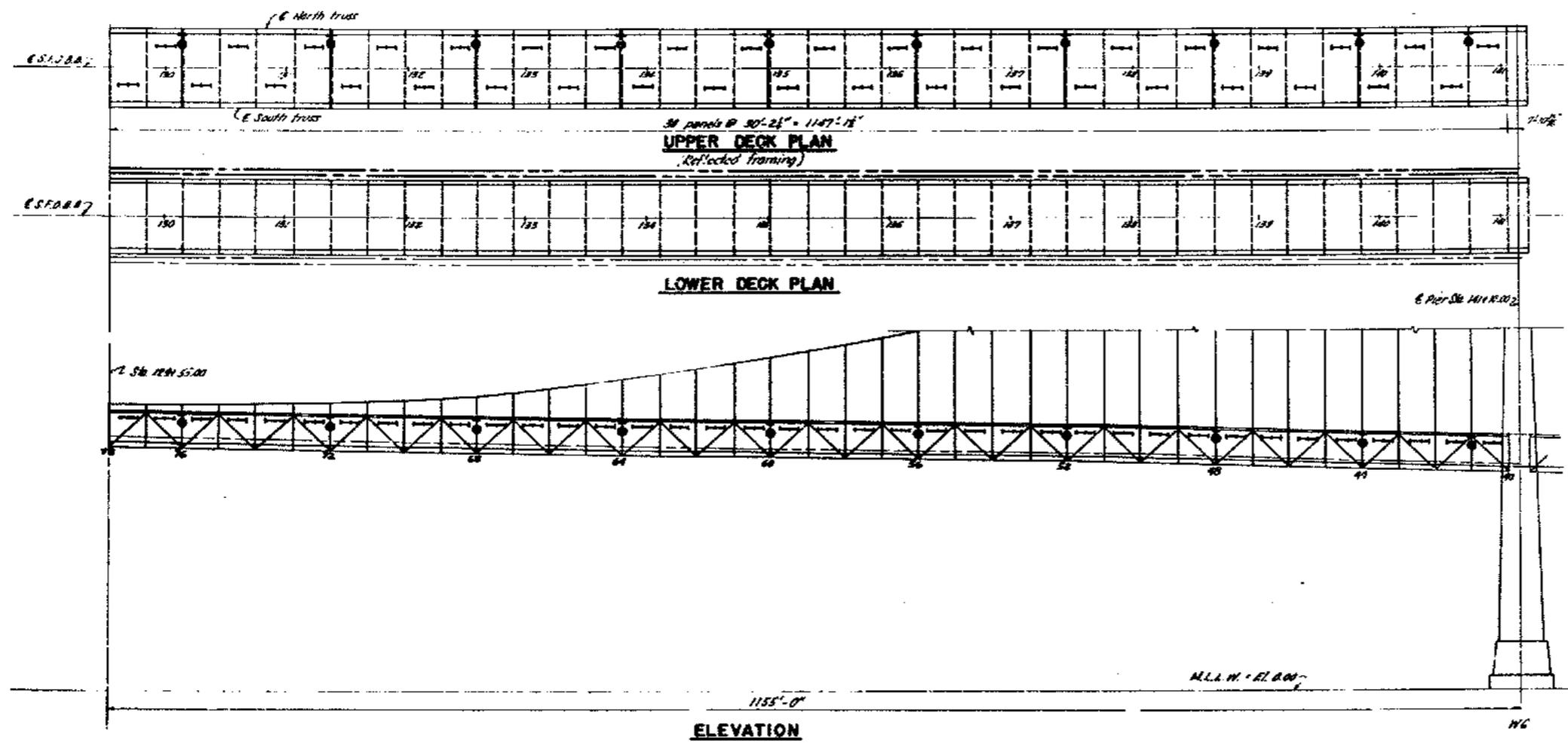
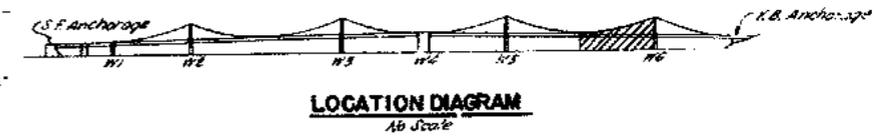
PLAN AND ELEVATION STA. 105+55 TO STA. 118+00

UNLESS NOTED SCALE 1"=50'

BRIDGE 34-04 SHEET NO. 14 DRAWING-C-3-27-14

MARK	DATE	DESCRIPTION	BY	CHK
1	02/1/62	As built with revisions	L.S.	H.B.P.





**TABULATION C. QUANTITIES**

PANEL POINT	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	TOTAL THIS SHEET	ACCUMULATED TOTAL
1. Remove electrical materials	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Remove existing conduits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3. Drilling holes in concrete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Miscellaneous work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. No boxes for Type I cable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. Type ND lighting installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Type ED lighting installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. Type EY lighting installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Type CS lighting installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Type CL lighting installation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11. Misc. electrical materials	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12. Threaded junction box	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13. 1/2 inch rigid conduit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14. 1/2 inch rigid conduit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15. Misc. - Armored 2 X 2 cable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16. 1-conductor #6 TH wire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17. 1-conductor #6 TH wire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18. 20' 2-conductor #6 cable	520	48.6	520	48.6	520	48.6	520	48.6	520	48.6	520	48.6	520	48.6	520	48.6	520	48.6	520	48.6	520	48.6	520	48.6	520
19. 20' 2-conductor #6 cable	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5
20. Miscellaneous electrical work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Quantities for these bid items only have revised of each panel point to agree with final "As Built" quantities. Accumulated totals of all "As Built" quantities are shown on Sheet No. 29.



STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

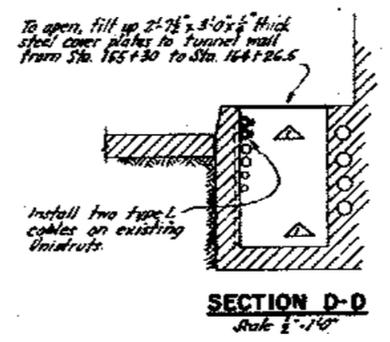
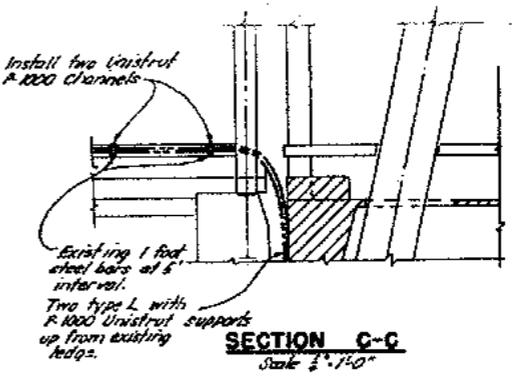
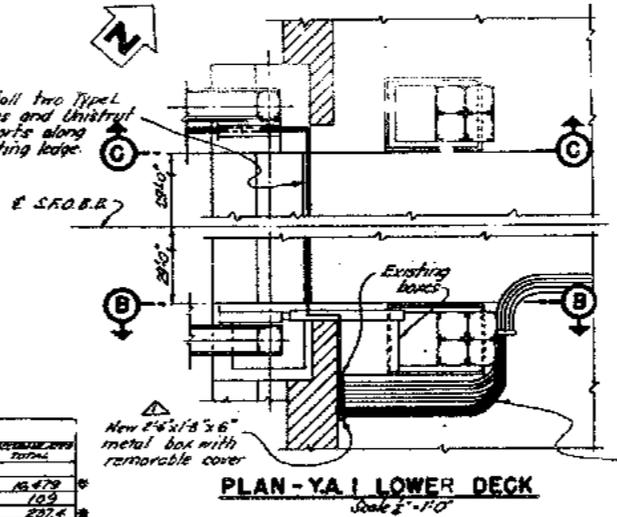
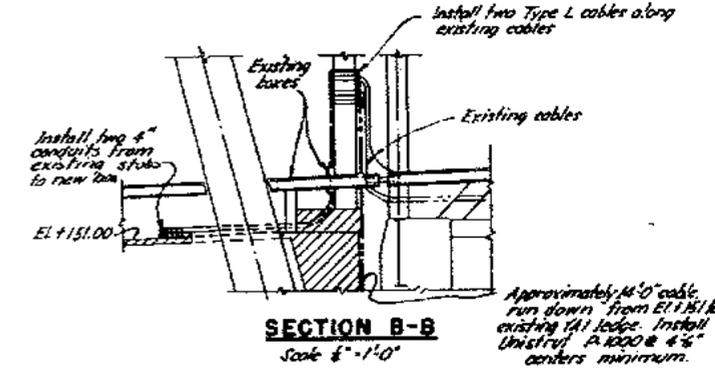
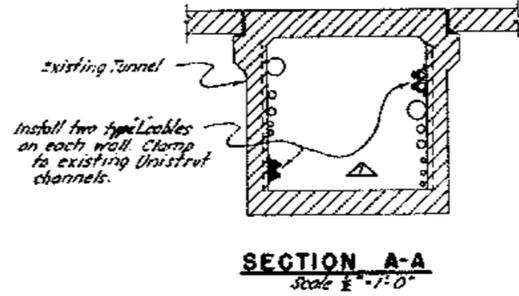
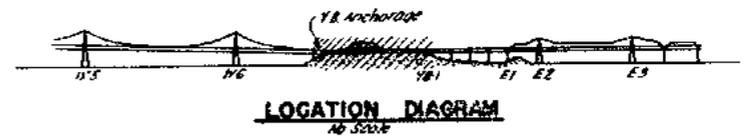
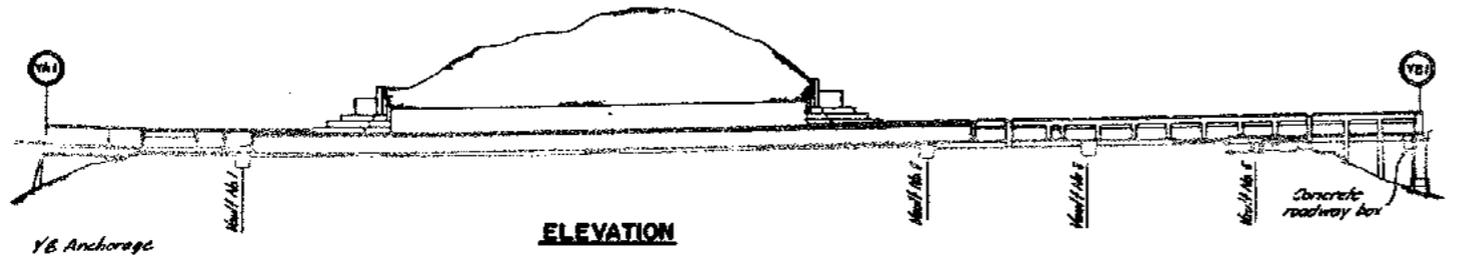
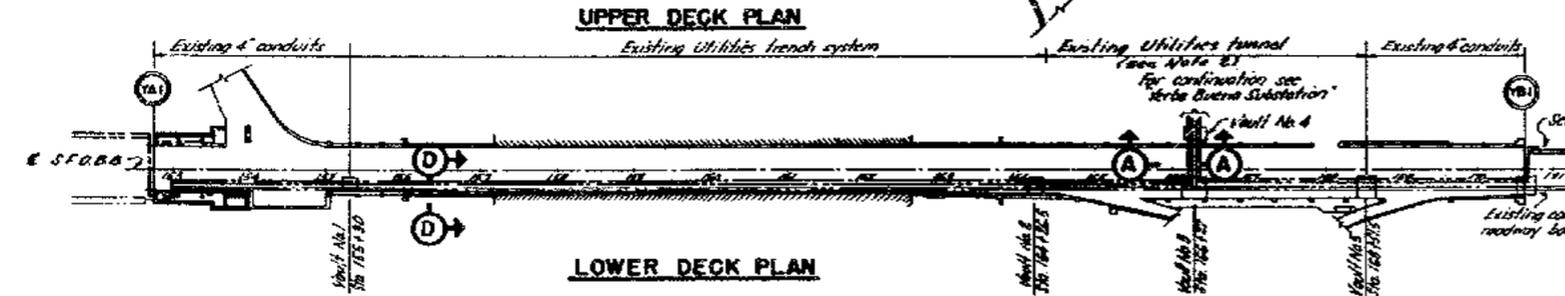
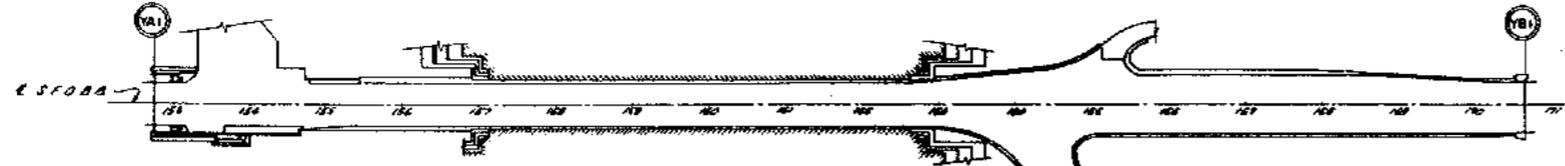
**SAN FRANCISCO-OAKLAND BAY BRIDGE  
RECONSTRUCTION  
LOWER DECK LIGHTING**

**PLAN AND ELEVATION STA. 129+55 TO STA. 141+10**

UNLESS NOTED SCALE 1" = 50'	33-25 34-03 BRIDGE 34-04	SHEET No. 16	DRAWING C-4027-HR
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MARK	DATE	DESCRIPTION	BY	CHK
REL 63		As built with revisions	CS	WS
		REVISION		





TABULATION OF QUANTITIES

ITEMS	UNIT	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	TOTAL QUANTITY	APPROXIMATE COST	
1. Remove electrical conduits	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,479	
2. Remove support hardware	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	
3. Drilling holes in concrete	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	237.4	
4. Miscellaneous supports	Lbs	340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,671.2	
5. Top boxes for type L cable	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	238	
6. Type L cable	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	546	
7. Type L lighting installation	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8. Type L lighting installation	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9. Type L lighting installation	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10. Type L lighting installation	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11. Steel furnished support hardware	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	
12. Weldless junction box	Lbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
13. 1/2 inch rigid conduit	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	
14. 1/2 inch rigid conduit	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,327.7	
15. Steel furnished 3 KV cable	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,212	
16. 1-conductor #6 TH wire	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,235.6	
17. 1-conductor #12 TH wire	L.F.	15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15,483.1	
18. Type L, 2 conductor #6 cable	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	
19. Type L, 3 conductor #6 cable	L.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,975.5	
20. 4 conductor electrical work	L.S.	40.8	2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79,308.9

\* Quantities for these bid items only have been revised at each panel point to agree with the built quantities. Approximate details of all the built quantities are shown on sheet no. 12.

- NOTES**
1. Pier YB-1 installations of type L cables are similar to those on Yerba Buena Anchorage - Bent YA-1, details shown on this sheet.
  2. Section A-A typical for installations in tunnel between vaults No. 2 and No. 5 except cable runs on one wall.



MARK	DATE	DESCRIPTION	BY	CHK

STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

**SAN FRANCISCO-OAKLAND BAY BRIDGE  
 RECONSTRUCTION  
 LOWER DECK LIGHTING**

**PLAN AND ELEVATION STA. 152+62 TO STA. 170+61**

UNLESS NOTED  
 SCALE 1" = 100'

BRIDGE 33-25  
 34-05

SHEET No. 18

DRAWING C-4027-18R

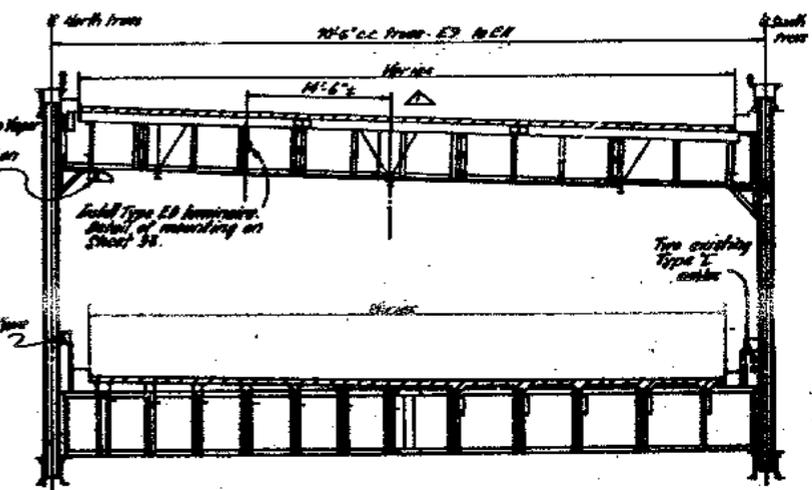
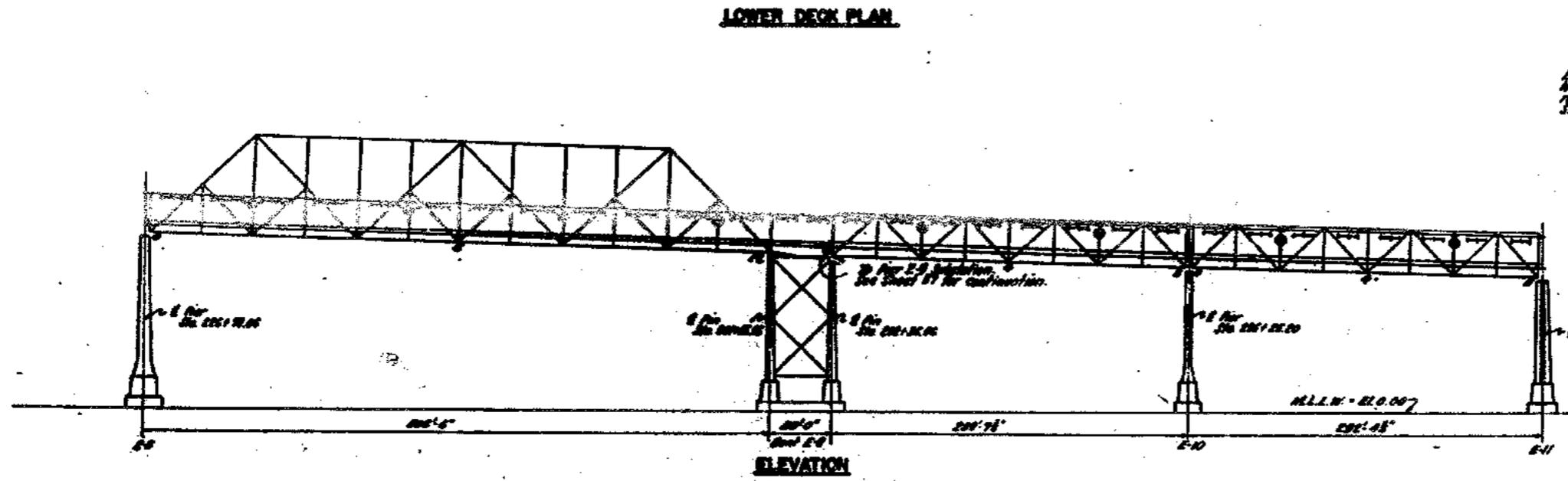
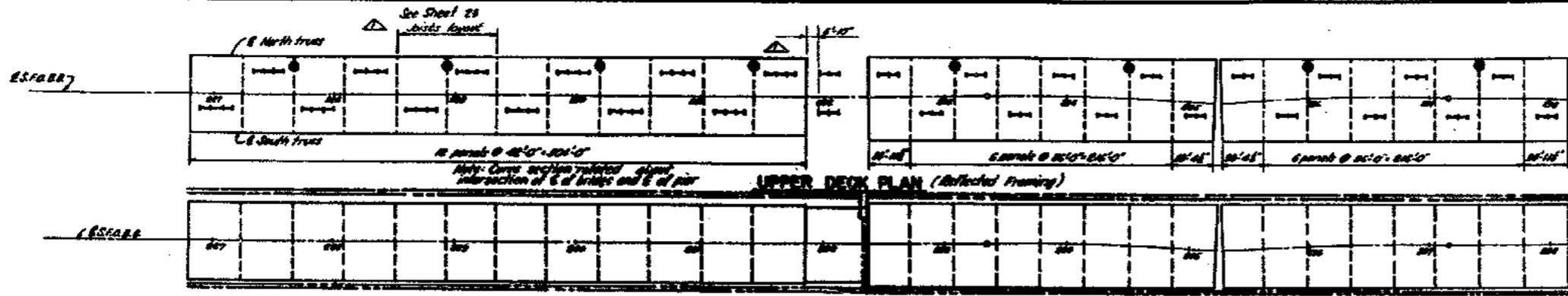




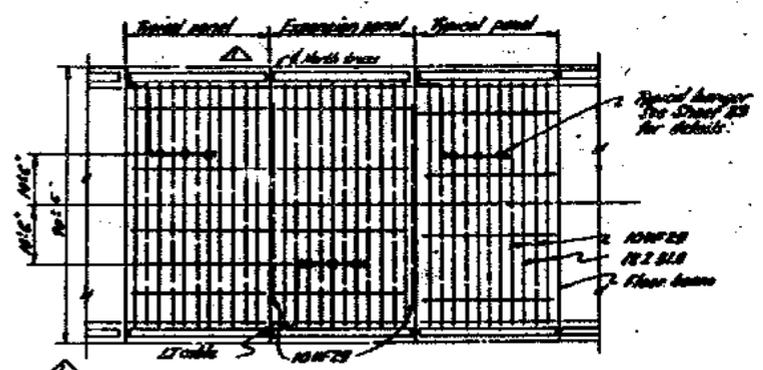








288 FT. SPANS - PIER E-9 TO E-11

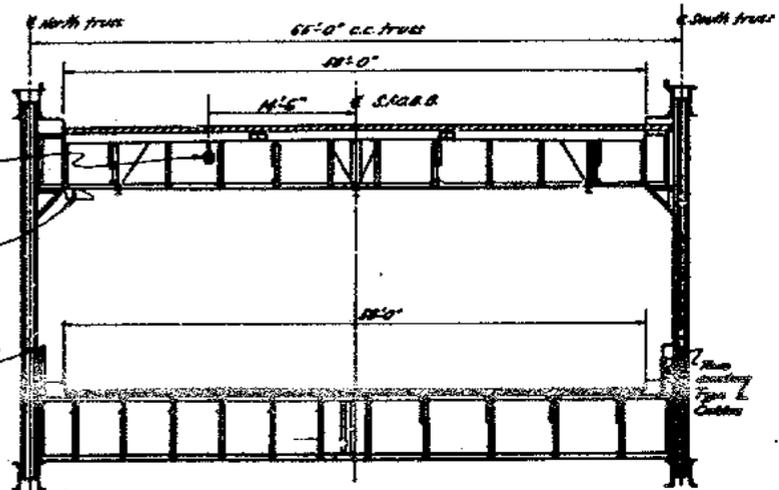
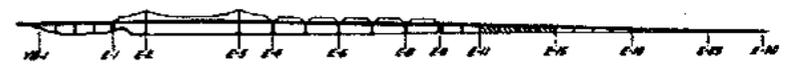
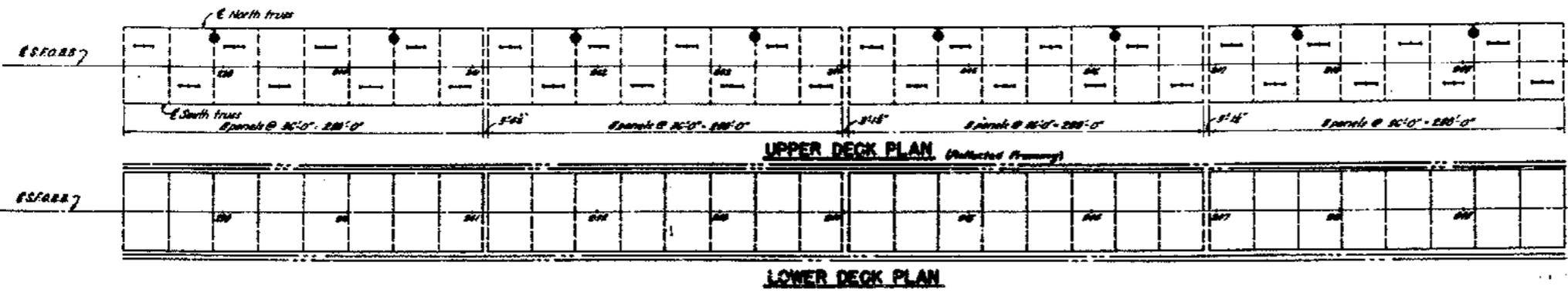


TABULATION OF QUANTITIES

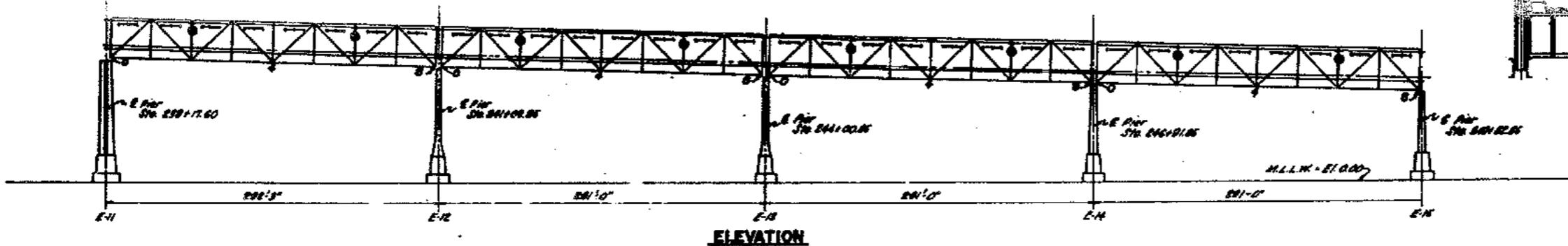
ITEM NO.	DESCRIPTION	QTY	UNIT	AMOUNT	UNIT PRICE	TOTAL	REMARKS
1	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...
46	...	...	...	...	...	...	...
47	...	...	...	...	...	...	...
48	...	...	...	...	...	...	...
49	...	...	...	...	...	...	...
50	...	...	...	...	...	...	...
51	...	...	...	...	...	...	...
52	...	...	...	...	...	...	...
53	...	...	...	...	...	...	...
54	...	...	...	...	...	...	...
55	...	...	...	...	...	...	...
56	...	...	...	...	...	...	...
57	...	...	...	...	...	...	...
58	...	...	...	...	...	...	...
59	...	...	...	...	...	...	...
60	...	...	...	...	...	...	...
61	...	...	...	...	...	...	...
62	...	...	...	...	...	...	...
63	...	...	...	...	...	...	...
64	...	...	...	...	...	...	...
65	...	...	...	...	...	...	...
66	...	...	...	...	...	...	...
67	...	...	...	...	...	...	...
68	...	...	...	...	...	...	...
69	...	...	...	...	...	...	...
70	...	...	...	...	...	...	...
71	...	...	...	...	...	...	...
72	...	...	...	...	...	...	...
73	...	...	...	...	...	...	...
74	...	...	...	...	...	...	...
75	...	...	...	...	...	...	...
76	...	...	...	...	...	...	...
77	...	...	...	...	...	...	...
78	...	...	...	...	...	...	...
79	...	...	...	...	...	...	...
80	...	...	...	...	...	...	...
81	...	...	...	...	...	...	...
82	...	...	...	...	...	...	...
83	...	...	...	...	...	...	...
84	...	...	...	...	...	...	...
85	...	...	...	...	...	...	...
86	...	...	...	...	...	...	...
87	...	...	...	...	...	...	...
88	...	...	...	...	...	...	...
89	...	...	...	...	...	...	...
90	...	...	...	...	...	...	...
91	...	...	...	...	...	...	...
92	...	...	...	...	...	...	...
93	...	...	...	...	...	...	...
94	...	...	...	...	...	...	...
95	...	...	...	...	...	...	...
96	...	...	...	...	...	...	...
97	...	...	...	...	...	...	...
98	...	...	...	...	...	...	...
99	...	...	...	...	...	...	...
100	...	...	...	...	...	...	...

Quantities for these bid items only have been revised at each panel point to agree with final field quantities. Revised details of all 25' panel quantities are shown on Sheet No. 22.

MARK DATE REVISION  
 PLAN AND ELEVATION STA. 226+79 TO STA. 230+18  
 SCALE 1" = 20'  
 SHEET No. 24



**288 FT. SPANS - PIER E-11 TO E-13**  
Scale: 1" = 10'



Install type ED luminaires  
Detail of mounting on Sheet 33

Existing Section vapor luminaires to be removed. See detail on Sheet 10

Install type L cobble

**TABULATION OF QUANTITIES**

PANEL POINT	0	4	8.0	12	16.0	20	24	28.0	32	36	40.0	44	48.0	52	56	60.0	64	68.0	72	76	80.0	84	88.0	92	96.0	100	TOTAL
Concrete deck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reinforcing steel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Truss steel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deck finish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lighting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Quantities for these bid items only have been revised at each panel point to agree with final "As Built" quantities. Accumulated totals of all "As Built" quantities are shown on Sheet No. 29.



STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
BUREAU OF SAN FRANCISCO BAY TOLL COORDINATOR

**SAN FRANCISCO - OAKLAND BAY BRIDGE RECONSTRUCTION**  
**LOWER DECK LIGHTING**

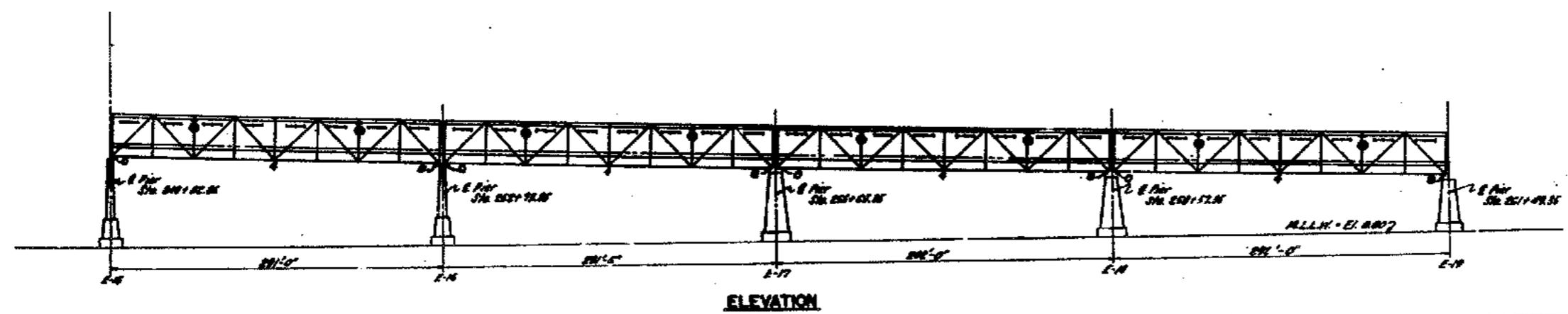
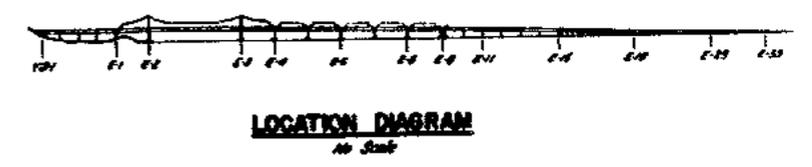
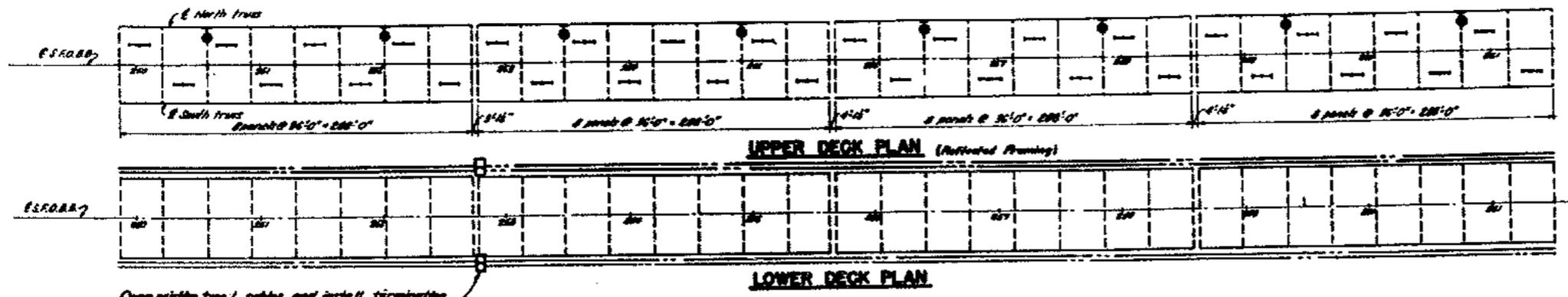
**PLAN AND ELEVATION STA. 238+18 TO STA. 248+83**

UNLESS NOTED SCALE 1" = 80'

DATE: 83-25  
BY: 84-03  
REVISION: 84-04

SHEET NO. 25  
DRAWING C-4027-25F

102163	As built with revisions	05	8.67
MARK	DATE	DESCRIPTION	BY
		REVISION	



**TABULATION OF QUANTITIES**

PANEL POINT	0	4	8.0	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	TOTAL	UNIT	
NO. 1750																											246	12.329	
NO. 1751																												176	1.374
NO. 1752																												40	1.051
NO. 1753																												146	1.146
NO. 1754																												146	1.146
NO. 1755																												146	1.146
NO. 1756																												146	1.146
NO. 1757																												146	1.146
NO. 1758																												146	1.146
NO. 1759																												146	1.146
NO. 1760																												146	1.146
NO. 1761																												146	1.146
NO. 1762																												146	1.146
NO. 1763																												146	1.146
NO. 1764																												146	1.146
NO. 1765																												146	1.146
NO. 1766																												146	1.146
NO. 1767																												146	1.146
NO. 1768																												146	1.146
NO. 1769																												146	1.146
NO. 1770																												146	1.146
NO. 1771																												146	1.146
NO. 1772																												146	1.146
NO. 1773																												146	1.146
NO. 1774																												146	1.146
NO. 1775																												146	1.146
NO. 1776																												146	1.146
NO. 1777																												146	1.146
NO. 1778																												146	1.146
NO. 1779																												146	1.146
NO. 1780																												146	1.146
NO. 1781																												146	1.146
NO. 1782																												146	1.146
NO. 1783																												146	1.146
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NO. 1787																												146	1.146
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NO. 1789																												146	1.146
NO. 1790																												146	1.146
NO. 1791																												146	1.146
NO. 1792																												146	1.146
NO. 1793																												146	1.146
NO. 1794																												146	1.146
NO. 1795																												146	1.146
NO. 1796																												146	1.146
NO. 1797																												146	1.146
NO. 1798																												146	1.146
NO. 1799																												146	1.146
NO. 1800																												146	1.146

Quantities for these bid items only have been revised at each panel point to agree with final "As Built" quantities. Accumulated totals of all "As Built" quantities are shown on Sheet No. 29.



STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF HIGHWAYS AND BRIDGE RECONSTRUCTION

**SAN FRANCISCO - OAKLAND BAY BRIDGE  
 RECONSTRUCTION  
 LOWER DECK LIGHTING**

**PLAN AND ELEVATION STA. 261+85 TO STA. 261+49**

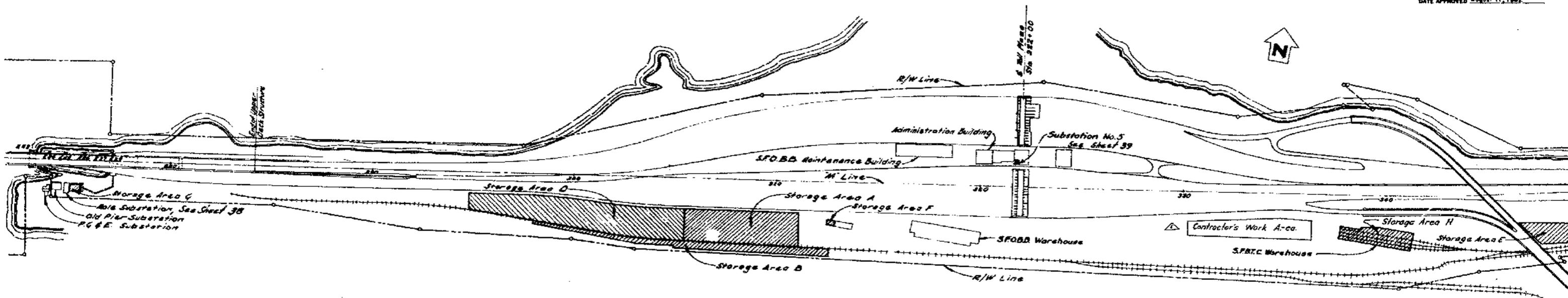
UNLESS NOTED SCALE 1" = 80'

BRIDGE 54-04 SHEET No. 26 DRAWING NO. 4027-26

MARK	DATE	DESCRIPTION	BY	CHK.
△		As built with revisions		







PLAN

TABULATION OF QUANTITIES

STATION	BID ITEM	UNIT	M 283+00						TOTAL QUANTITIES	ACCUMULATED TOTALS
			M 283+00	M 285+00	M 287+00	M 289+00	M 291+00	M 293+00		
01	Remove electrical material	Lbs.	0	0	0	0	0	0	12,679 *	
02	Remove existing luminaires	Lbs.	0	0	0	0	0	0	1,874 *	
03	Drillings holes in concrete	L.F.	0	0	0	0	0	0	2,057 *	
04	Miscellaneous materials	Lbs.	0	0	0	0	0	0	388 *	
05	Two boxes for Type 1 cable	Lbs.	0	0	0	0	0	0	382 *	
06	Type 10 luminaire installation	Lbs.	0	0	0	0	0	0	178 *	
07	Type 10 luminaire installation	Lbs.	0	0	0	0	0	0	178 *	
08	Type 11 luminaire installation	Lbs.	0	0	0	0	0	0	15 *	
09	Type 12 luminaire installation	Lbs.	0	0	0	0	0	0	42 *	
10	Type 13 luminaire installation	Lbs.	0	0	0	0	0	0	8 *	
11	Steel structural support luminaires	Lbs.	0	0	0	0	0	0	40 *	
12	Installation luminaire box	Lbs.	0	0	0	0	0	0	3,173 *	
13	3/4 inch rigid conduit	L.F.	0	0	0	0	0	0	2,227 *	
14	1/2 inch rigid conduit	L.F.	0	0	0	0	0	0	5,209 *	
15	Steel structural support luminaires	Lbs.	0	0	0	0	0	0	19,337 *	
16	1 conductor #6 1/2 wire	L.F.	0	0	0	0	0	0	3,792 *	
17	1 conductor #6 1/2 wire	L.F.	0	0	0	0	0	0	30,922 *	
18	Type 11, 2 conductor #6 cable	L.F.	0	0	0	0	0	0	52,028 *	
19	Type 1, 2 conductor #6 cable	L.F.	0	0	0	0	0	0	65 *	
20	Miscellaneous electrical work	L.F.	0	0	0	0	0	0		

\* Quantities for these bid items only have been revised at each panel point to agree with final "As built" quantities. Accumulated totals of all "As built" quantities are shown on this sheet.



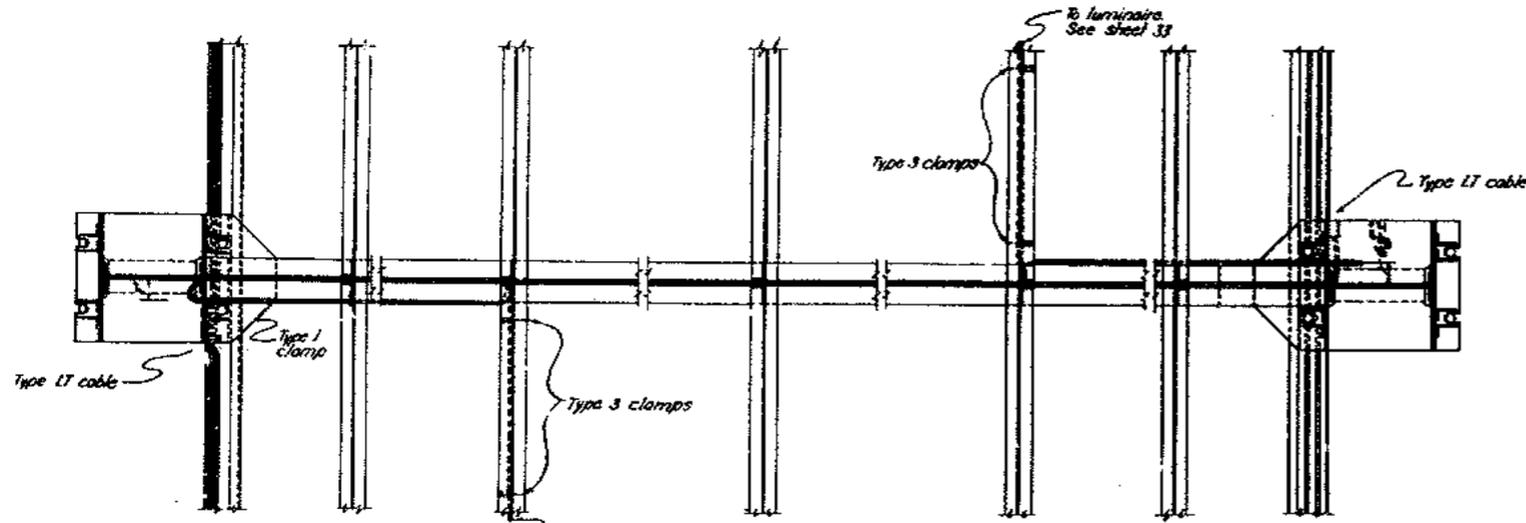
STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF SAN FRANCISCO BAY TOLL CIRCUMVENTION

**SAN FRANCISCO-OAKLAND BAY BRIDGE  
 R.L. CONSTRUCTION  
 LOWER DECK LIGHTING**

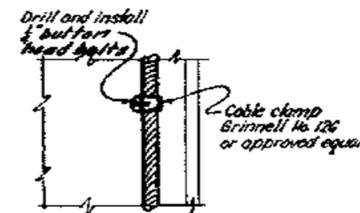
**PLAN - STA. 283+97 TO STA. 345+00**

MARK	DATE	DESCRIPTION	BY	CHK.
△	12/5/61	As built with revisions	DB	W.E.F.
		REVISION		

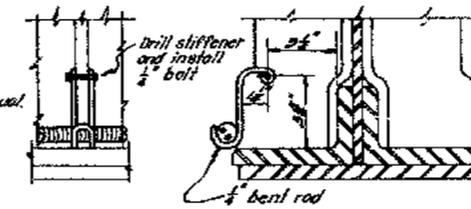
SCALE 1" = 200'  
 BRIDGE 33-2E  
 33-1C  
 33-04  
 SHEET No. 29  
 DRAWING C-4027-29R



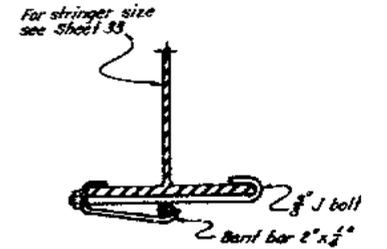
SECTION A-A



TYPE 1



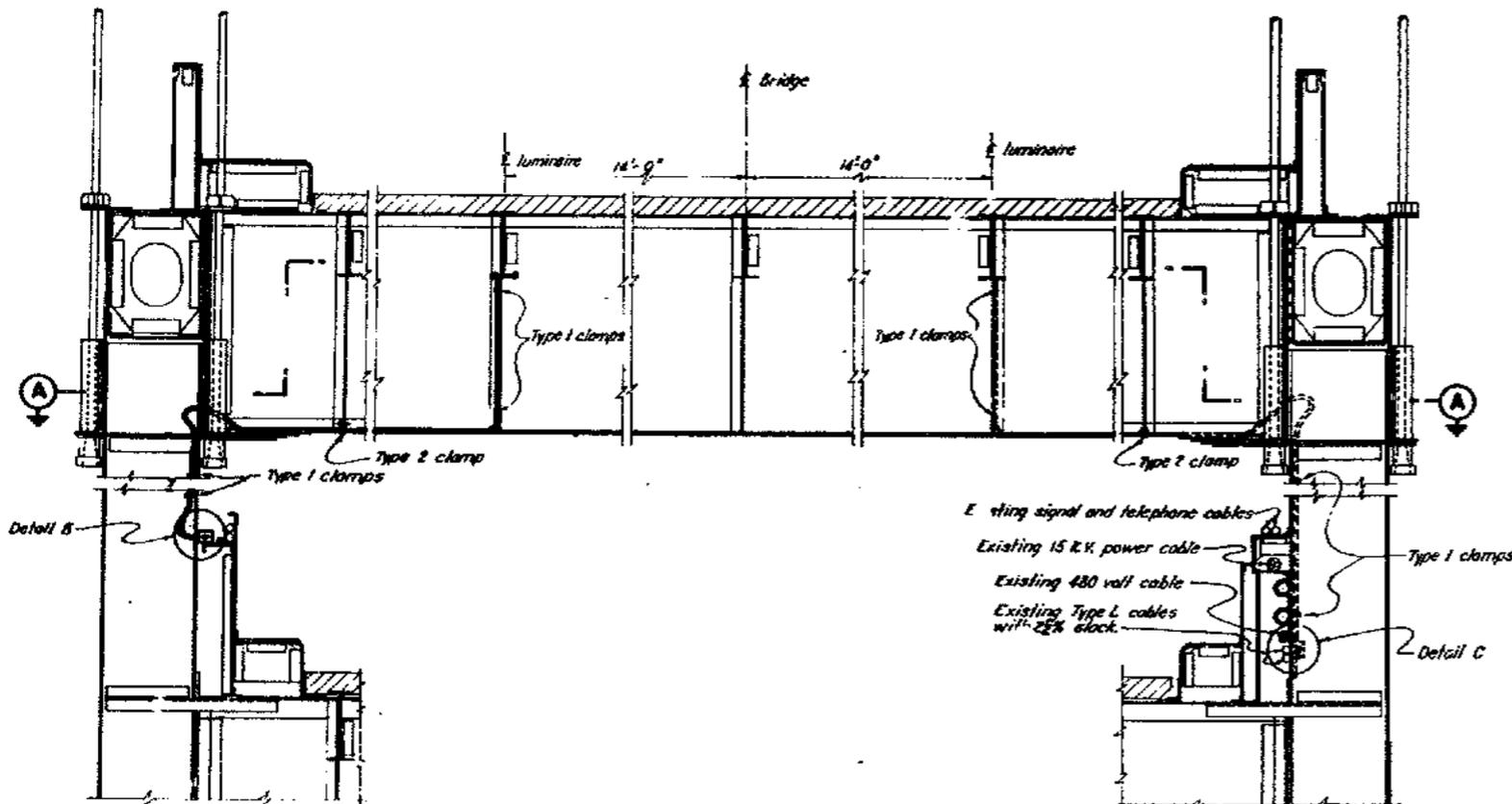
TYPE 2



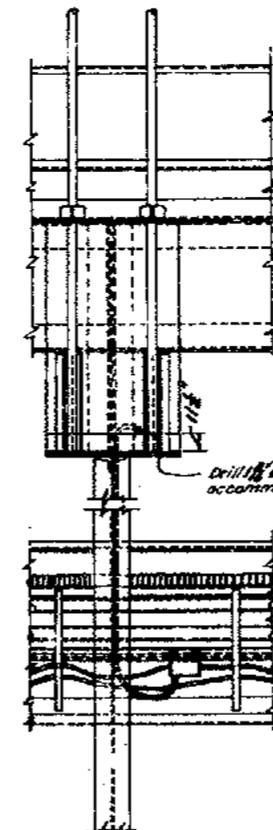
TYPE 3

TYPE LT CABLE - CLAMP DETAILS

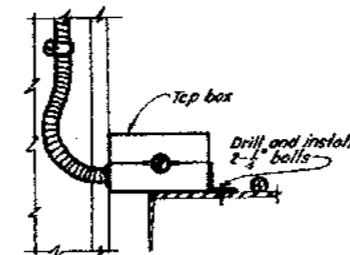
Scale: 3" = 1'-0"



TYPICAL SECTION

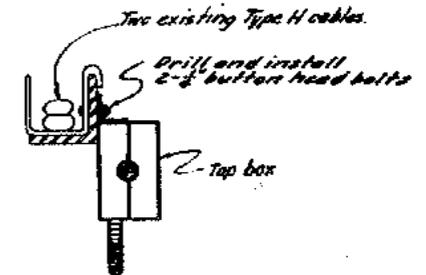


SIDE VIEW



DETAIL B

Scale: 3" = 1'-0"



DETAIL C

Scale: 3" = 1'-0"

NOTES

1. Maximum spacing for type 1 and type 3 clamps shall be 4'-6". Type 2 clamps shall be attached to existing stiffeners.
2. For top box details see Sheet No. 42.

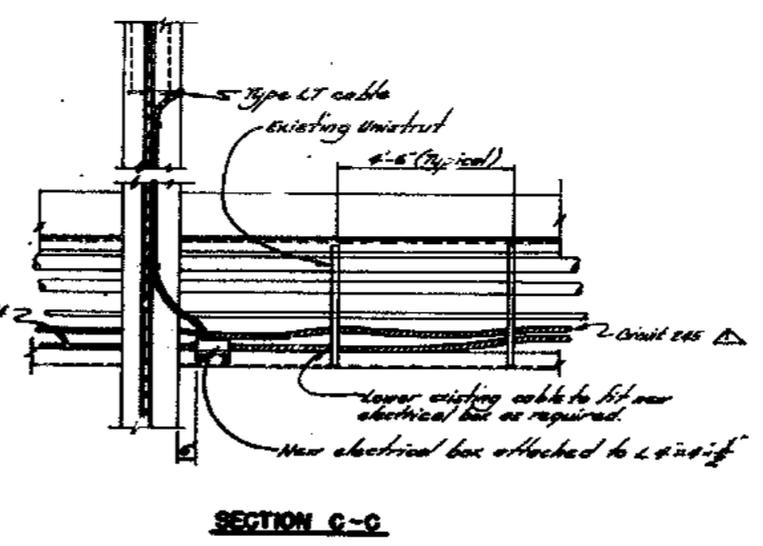
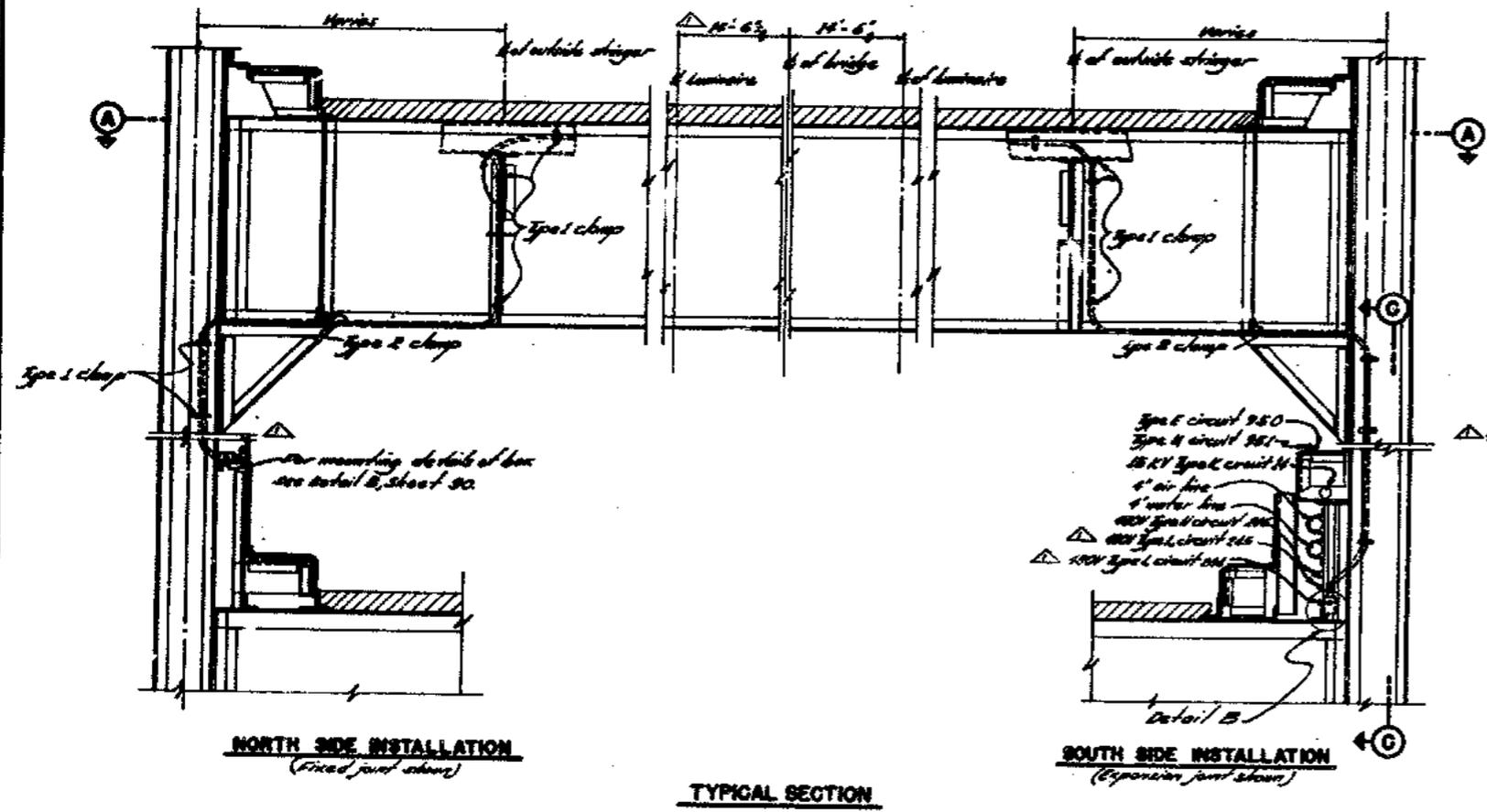
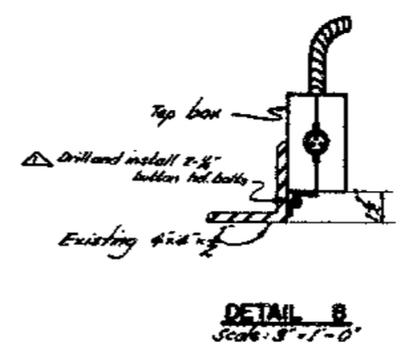
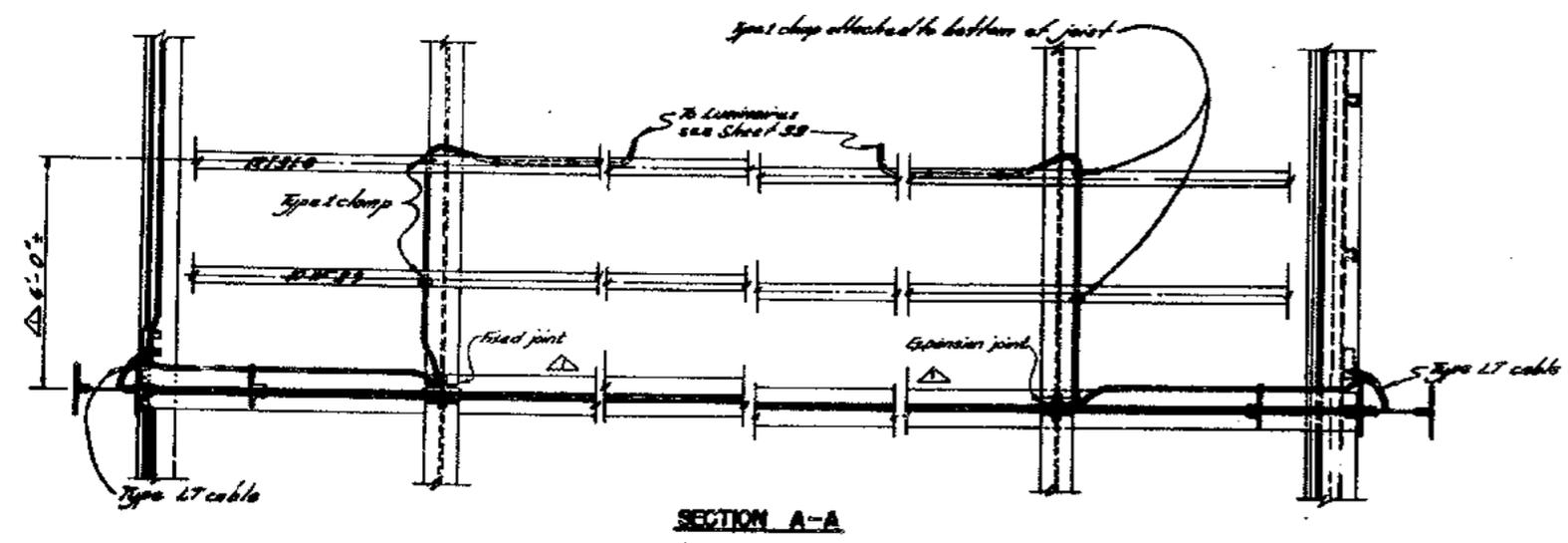


As built with revisions. BPS/WST			
MARK	DATE	DESCRIPTION	BY
			CHK
UNLESS NOTED		BY	DATE
		BY	DATE
Sheet No. 30		DRAWING C-407702	

STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF SAN FRANCISCO BAY TOLL COORDINATOR

**SAN FRANCISCO-OAKLAND BAY BRIDGE  
RECONSTRUCTION  
LOWER DECK LIGHTING**

**CABLE INSTALLATION - WEST BAY**



- NOTES:**
1. For cable clamp details, see Sheet 30.
  2. For top box details see sheet 42.



MARK	DATE	DESCRIPTION	BY	CHK	UNLESS NOTED SCALE IS 1/4\"/>
▲	11/1/51	As built with revisions	J.L.S.	M.B.T.	BRIDGE 33-25
					34-03
					34-04

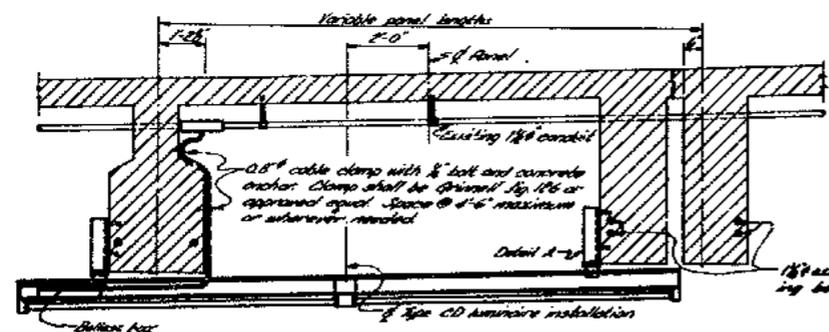
STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 OFFICE OF SAN FRANCISCO BAY TOLL ENGINEER

**SAN FRANCISCO-OAKLAND BAY BRIDGE  
 RECONSTRUCTION  
 LOWER DECK LIGHTING**

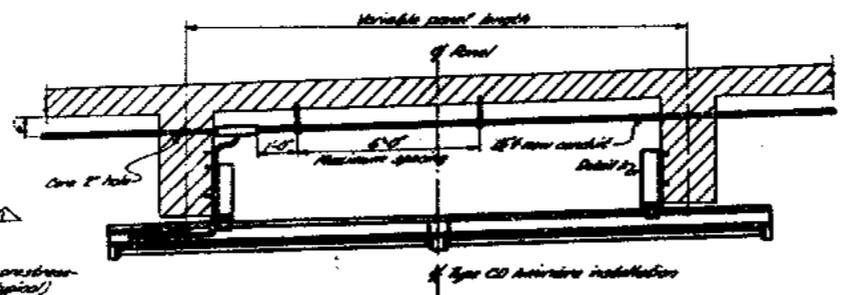
**CABLE INSTALLATION - EAST BAY**

BRIDGE 33-25  
 34-03  
 34-04

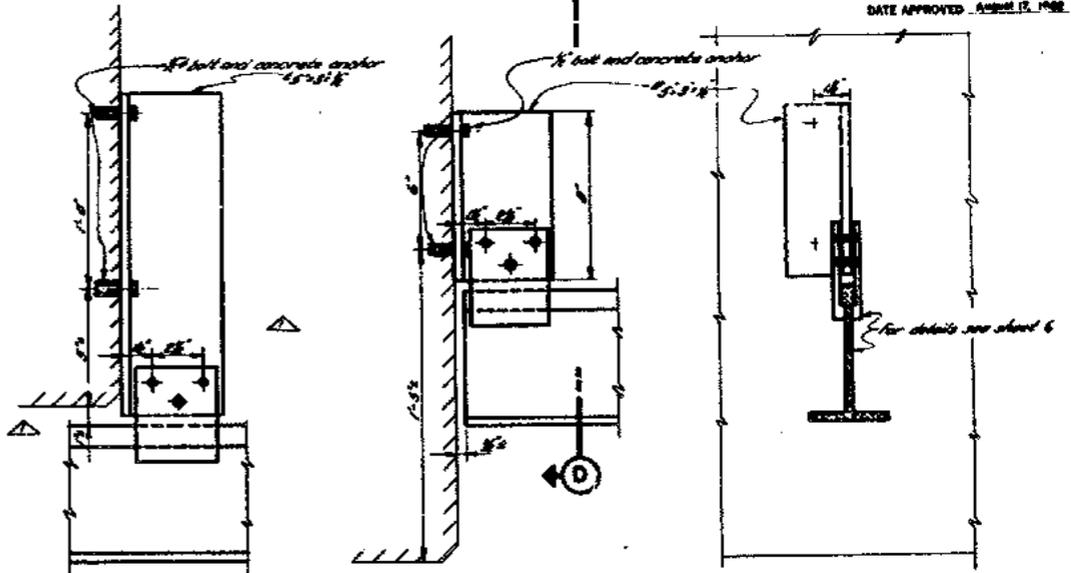
SHEET NO. 31  
 DRAWING C4027-31A



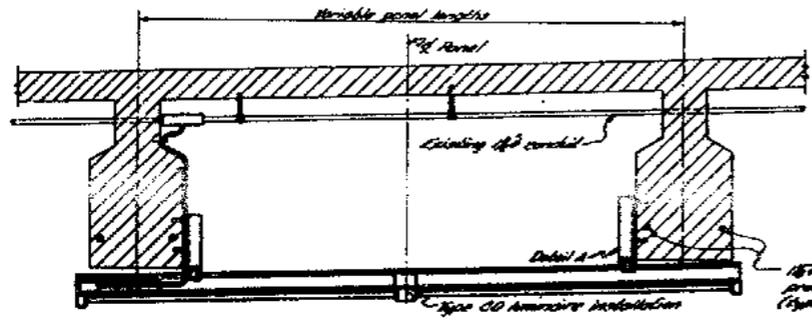
**EXPANSION PANEL**



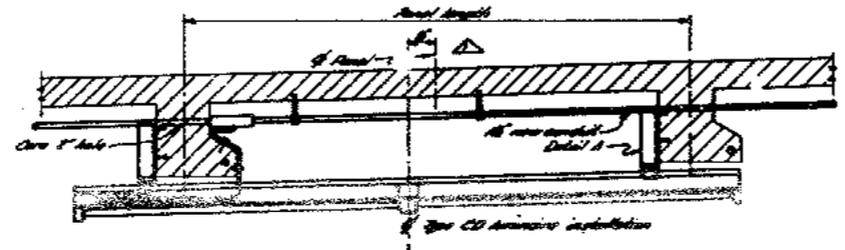
**TYPICAL PANEL  
BENT 38 TO 41 AND 43 TO 1**



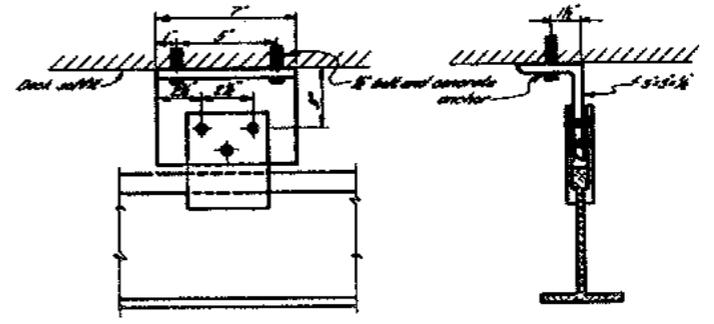
**DETAIL A  
BEAM SIDE HANGERS**  
**DETAIL B  
BEAM SIDE HANGERS**  
**SECTION D-D**



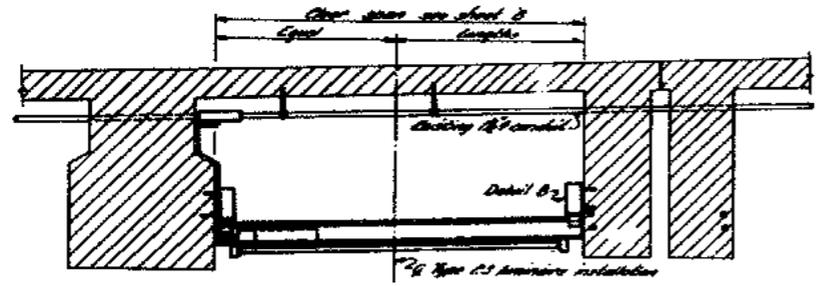
**TYPICAL PANEL  
BENT 23 TO 30 AND 35 TO 38**



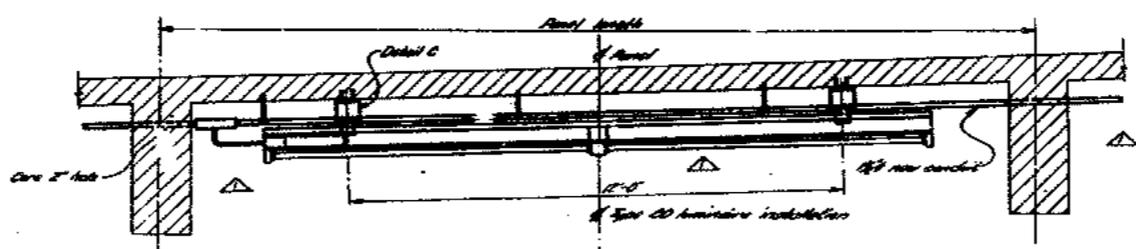
**TYPICAL PANEL  
BENT 41 TO 43**



**DETAIL C  
DECK SOFFIT HANGER**



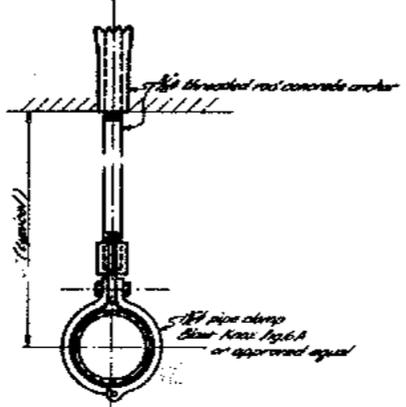
**EXPANSION PANEL**



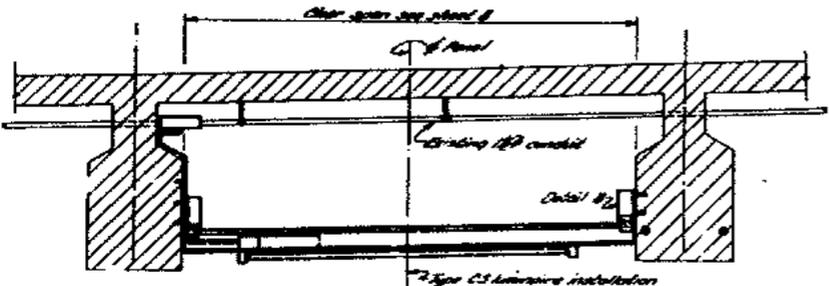
**TYPICAL PANEL  
BENT 1 TO 8**

**LUMINAIRE HANGER DETAILS**  
Scale: 3/4" = 1'-0"

- NOTES:**
- Luminaires shall be hung parallel to upper deck.
  - For luminaire details see sheet 6.
  - For location of luminaires see sheets 7 and 8.
  - Panel outcropping by angle hanger as provided to conform to luminaire alignment.
  - Apply red-lead paste to contact surface between angle hanger and concrete.
  - All hangers shall be fabricated from A-7 steel.



**TYPICAL CONDUIT HANGER**  
Scale: 1/2" = 1'-0"



**TYPICAL PANEL  
BENT 30 TO 36**

MARK	DATE	DESCRIPTION	BY	CHK
ASIS		As built with revisions	LLS	W.B.
		REVISION		

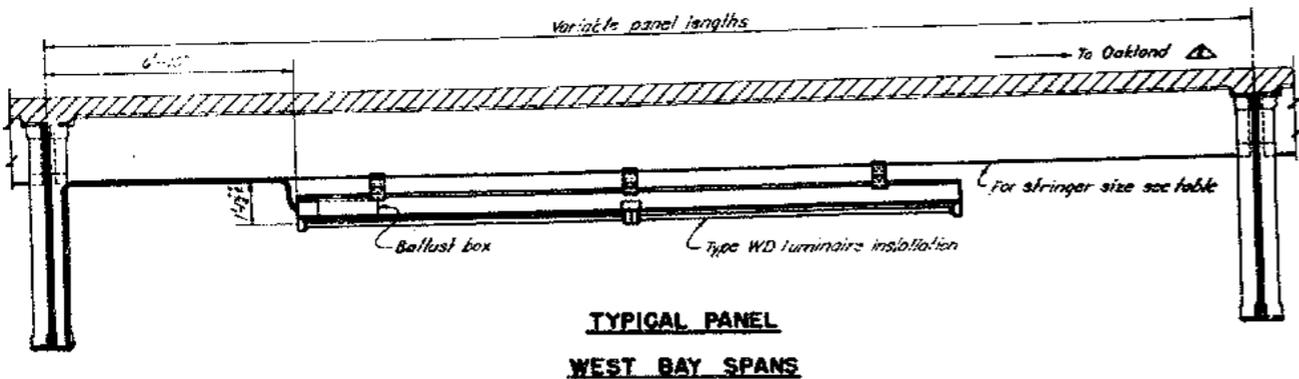
UNLESS NOTED	SCALE 1/2" = 1'-0"	BRIDGE	SHEET No. 32	DRAWING C-1027-1
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STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

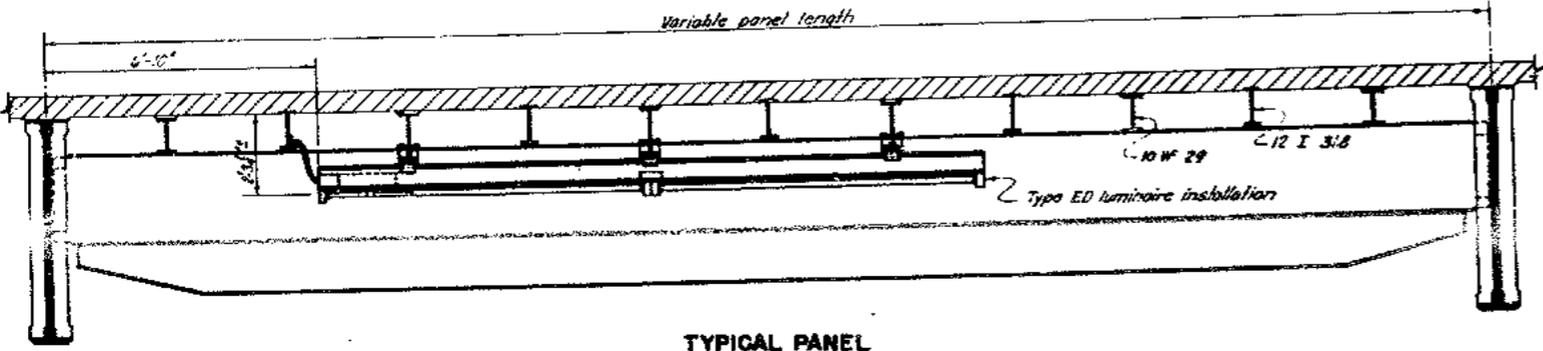
**SAN FRANCISCO-OAKLAND BAY BRIDGE  
 RECONSTRUCTION  
 LOWER DECK LIGHTING**

**LUMINAIRE INSTALLATIONS-CONCRETE STRUCTURE**

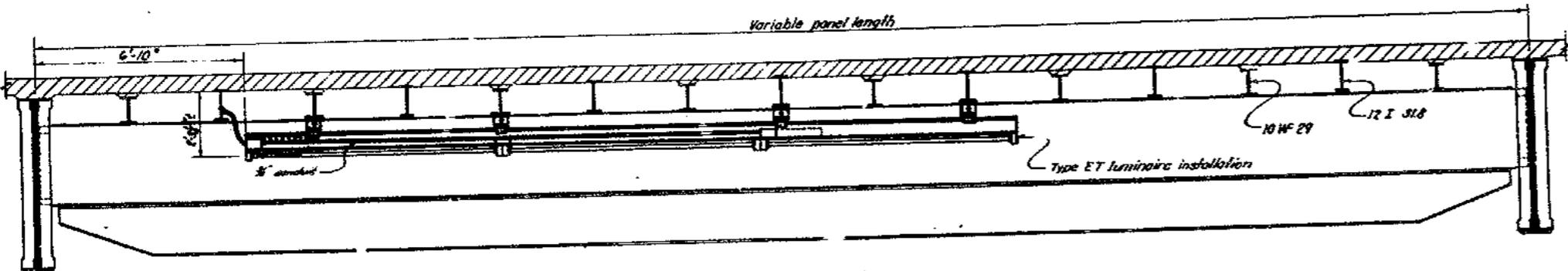
DESIGN AND DETAILS PROVIDED BY CH2M HILL



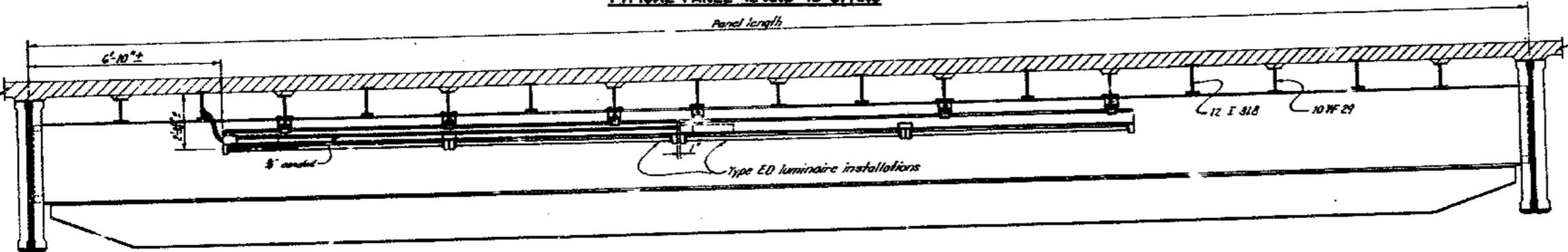
TYPICAL PANEL  
 WEST BAY SPANS



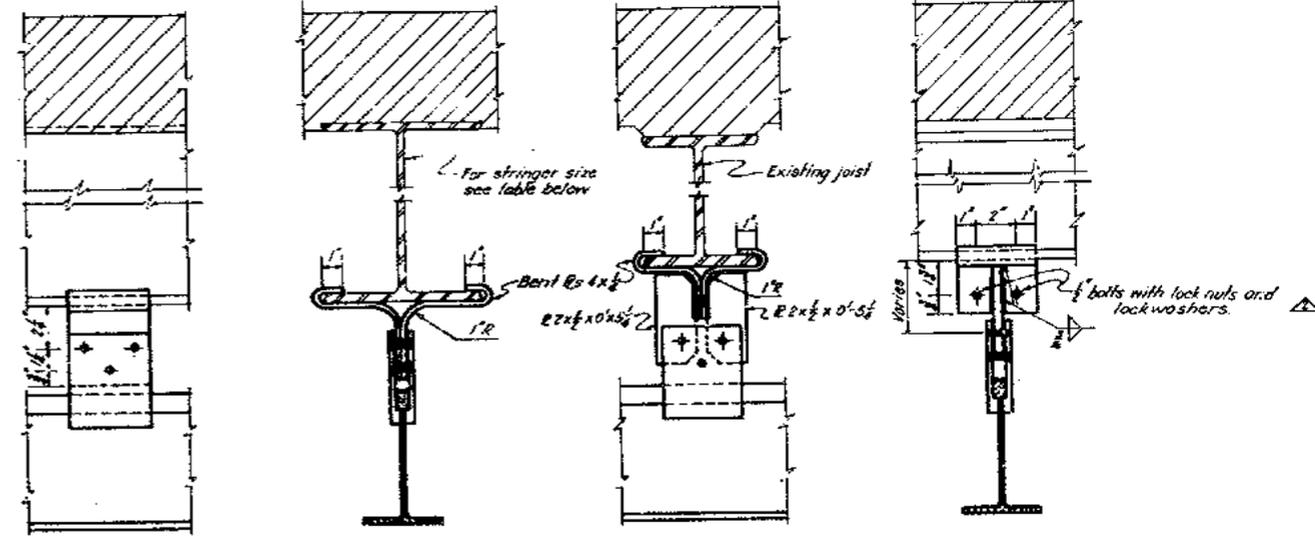
TYPICAL PANEL



TYPICAL PANEL 42' AND 48' SPANS



TYPICAL PANEL 55' SPANS  
 EAST BAY SPANS



WEST BAY STRINGER SIZES	
LOCATION	SIZE
S.P. Anchorage	14 CB 46
Continuous Spans	21 CB 59
Suspension Spans	20 CB 55
Center Anchorage (W4)	24 CB 74
Pier W1	12 CB 64

NOTES

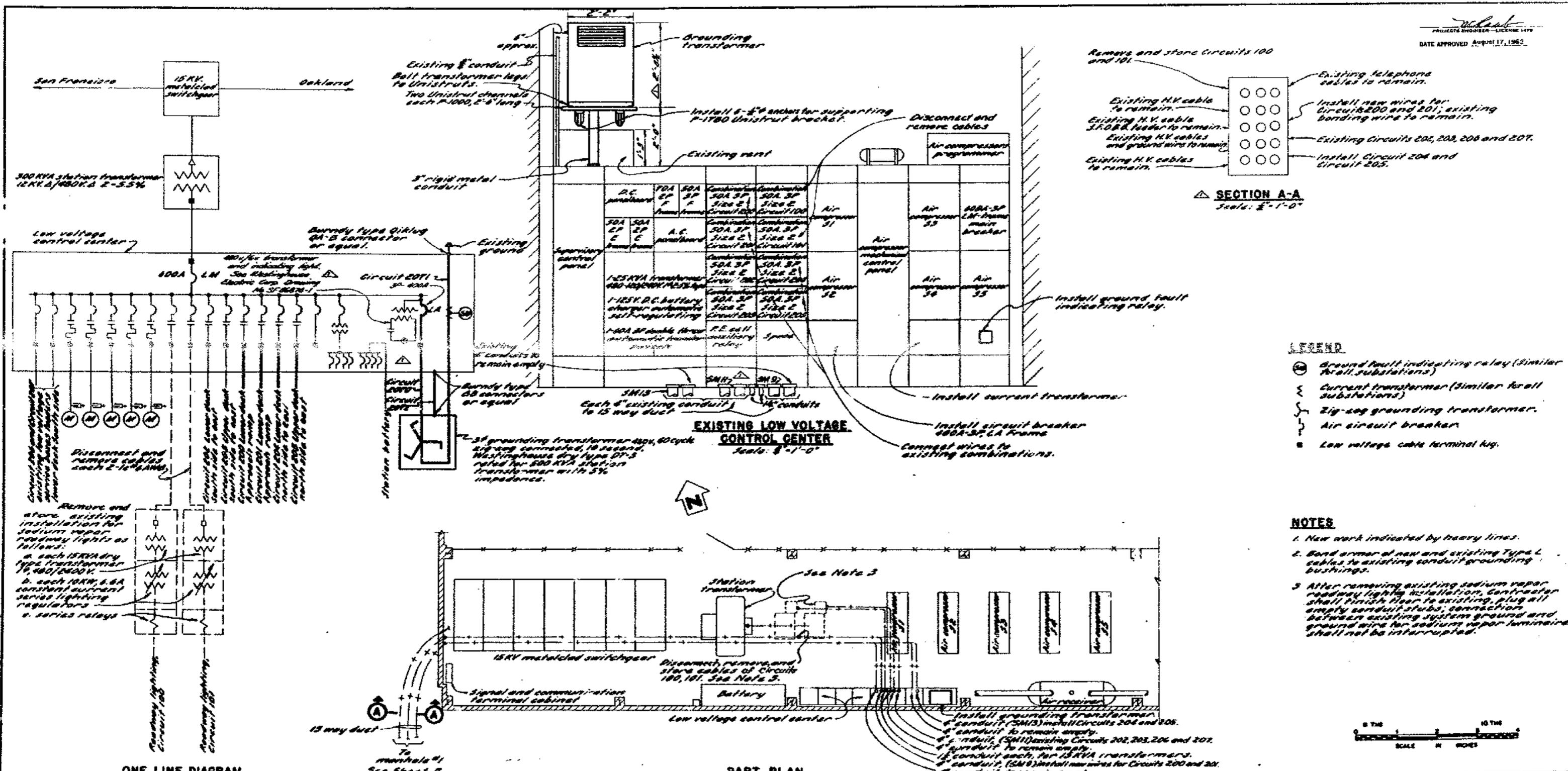
- Luminaires shall be hung parallel to upper deck.
- For luminaire details see sheet 6.
- For location of luminaires and luminaire hangers see sheets 19, 21, 23 and 24.
- Beam clamps shall be fabricated scant to provide a driving fit.
- For cable run and clamps see sheets 30 and 31.
- All hangers shall be fabricated from A7 steel.



SUPPLEMENTAL CONTRACT DRAWING

STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS	
SAN FRANCISCO-OAKLAND BAY BRIDGE RECONSTRUCTION LOWER DECK LIGHTING	
LUMINAIRE INSTALLATIONS- STEEL STRUCTURE	
UNLESS NOTED SCALE 1/2" = 1'-0"	BRIDGE 34-04
SHEET No. 33	DRAWING C-4027-33R

MARK	DATE	DESCRIPTION	BY	CHK
AR263		As built with revisions	CB	A.S.P.
10-5-52		Location of Type WD Luminaire @ Pier W1 changed	ARB	CS



**SECTION A-A**  
Scale: 2"=1'-0"

**EXISTING LOW VOLTAGE CONTROL CENTER**  
Scale: 2"=1'-0"

**PART PLAN**  
Scale: 2"=1'-0"

- LEGEND**
- ⊕ Ground fault indicating relay (similar to all substations)
  - ⊕ Current transformer (similar to all substations)
  - ⌋ Zig-zag grounding transformer.
  - ⌋ Air circuit breaker
  - Low voltage cable terminal lug.

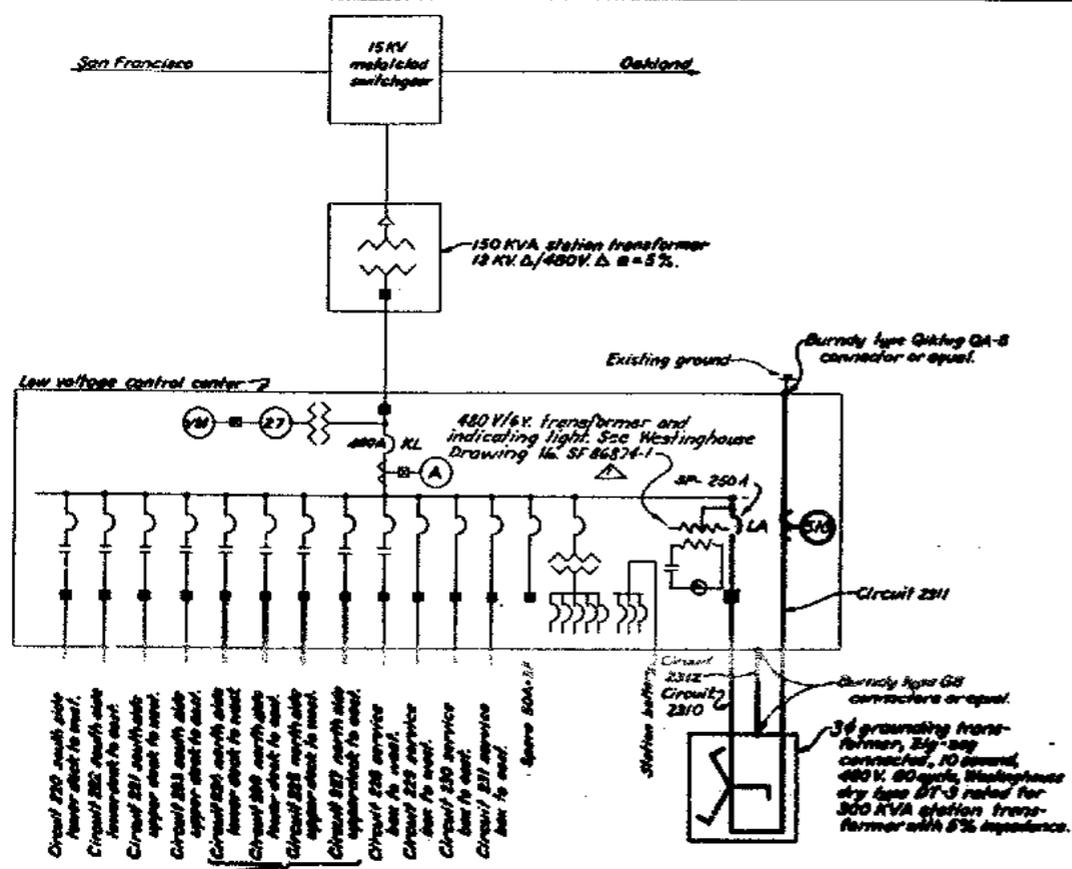
- NOTES**
1. New work indicated by heavy lines.
  2. Bond armor of new and existing Type L cables to existing conduit grounding bushings.
  3. After removing existing sodium vapor roadway lighting installation, contractor shall finish floor to existing, plug all empty conduit stubs; connection between existing system ground and ground wire for sodium vapor luminaires shall not be interrupted.



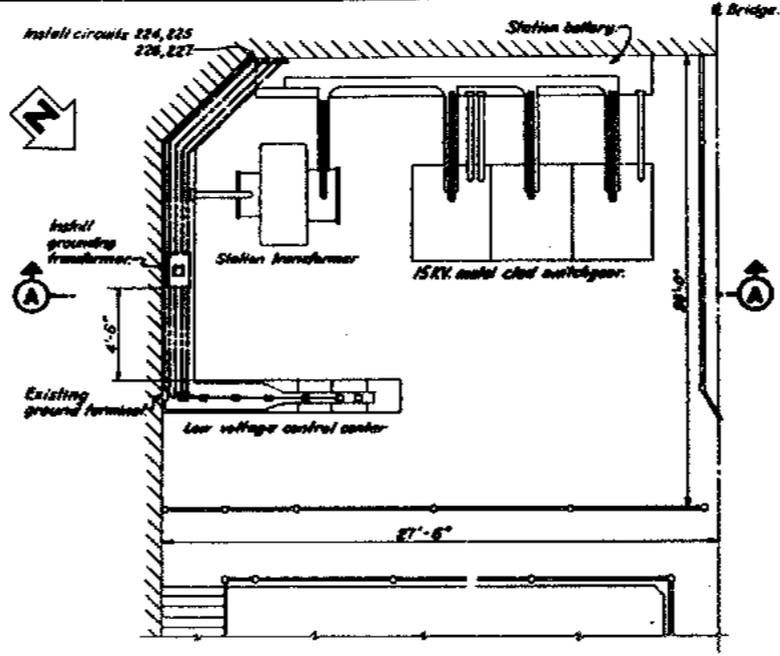
**ONE LINE DIAGRAM**

SAN FRANCISCO-OAKLAND BAY BRIDGE RECONSTRUCTION LOWER DECK LIGHTING			
STERLING SUBSTATION			
SCALE AS SHOWN	BRIDGE 34-04	SHEET No 34	DRAWING C-4027-34R

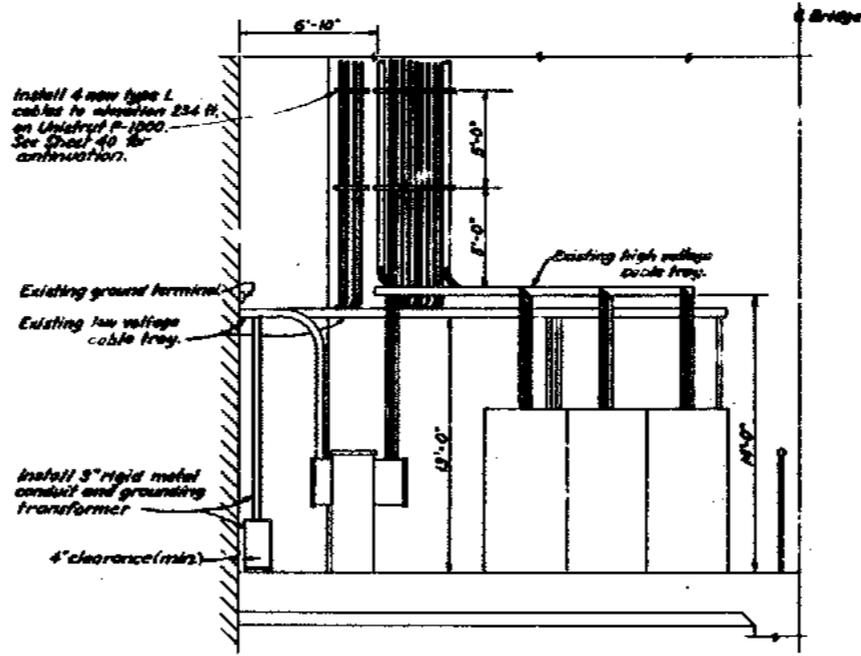
MARK	DATE	REVISION	BY	CHK



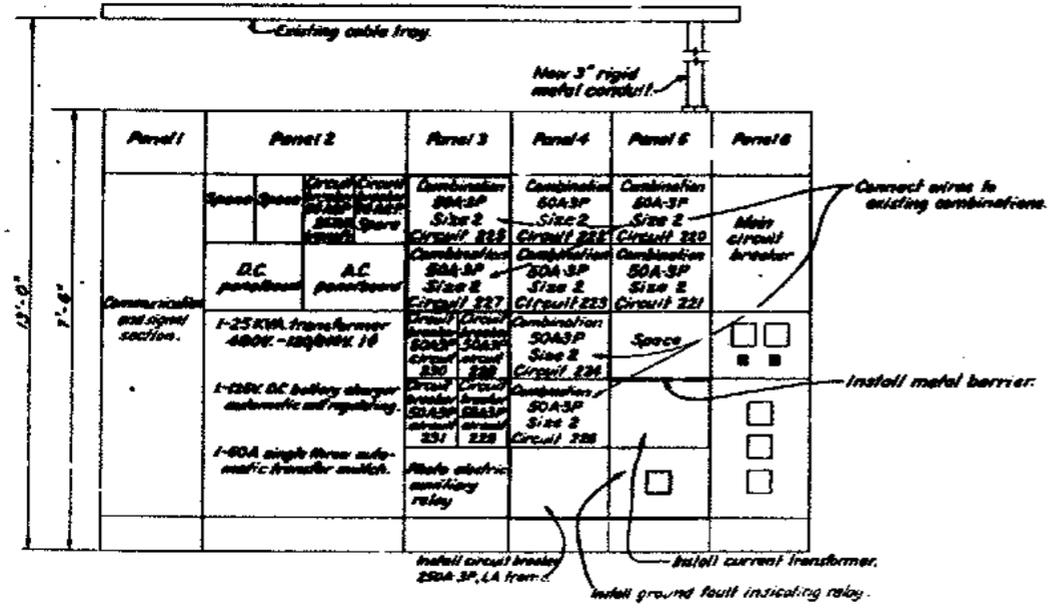
**ONE LINE DIAGRAM**



**PLAN (See Note)**  
Scale: 1/2" = 1'-0"



**SECTION A-A**  
Scale: 1/2" = 1'-0"



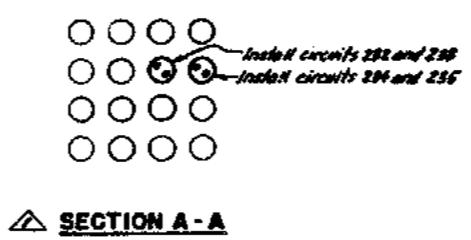
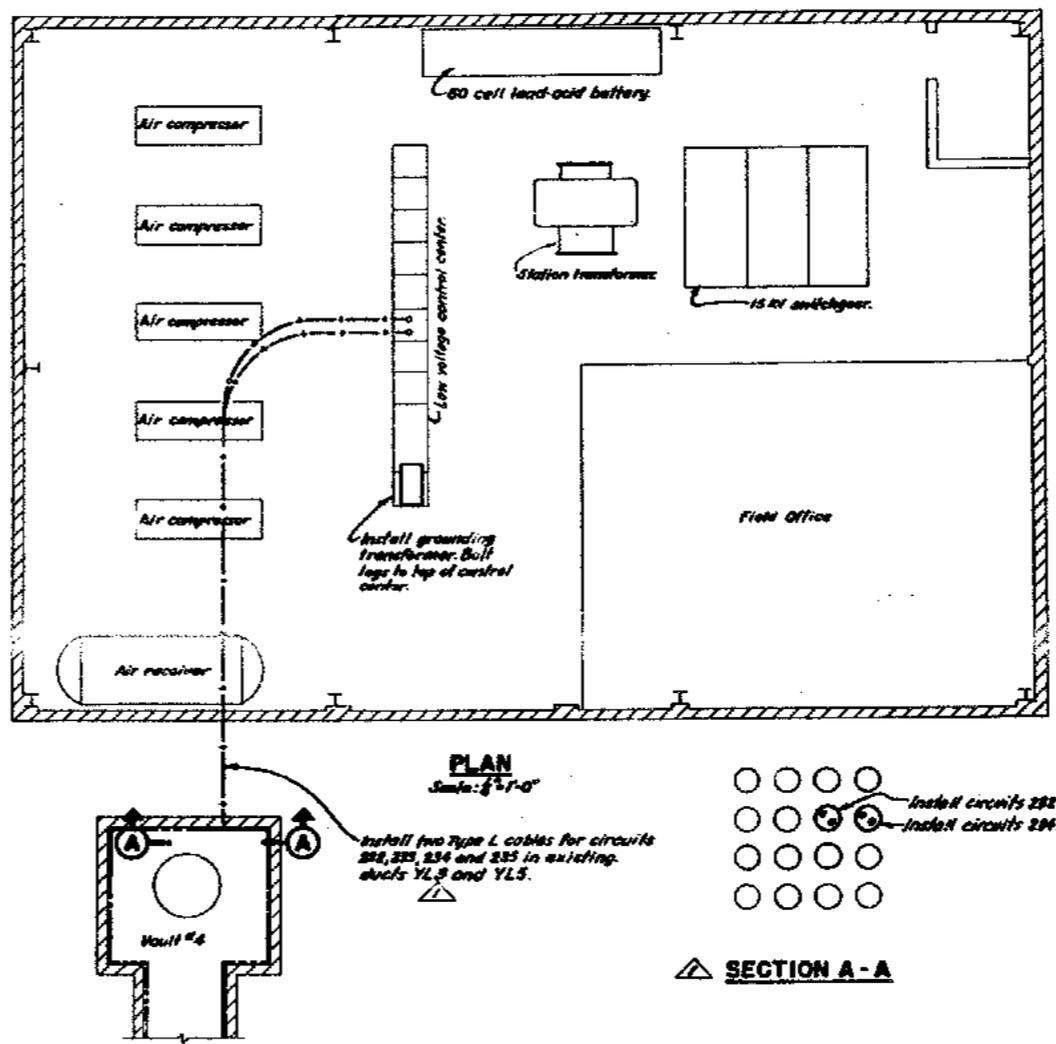
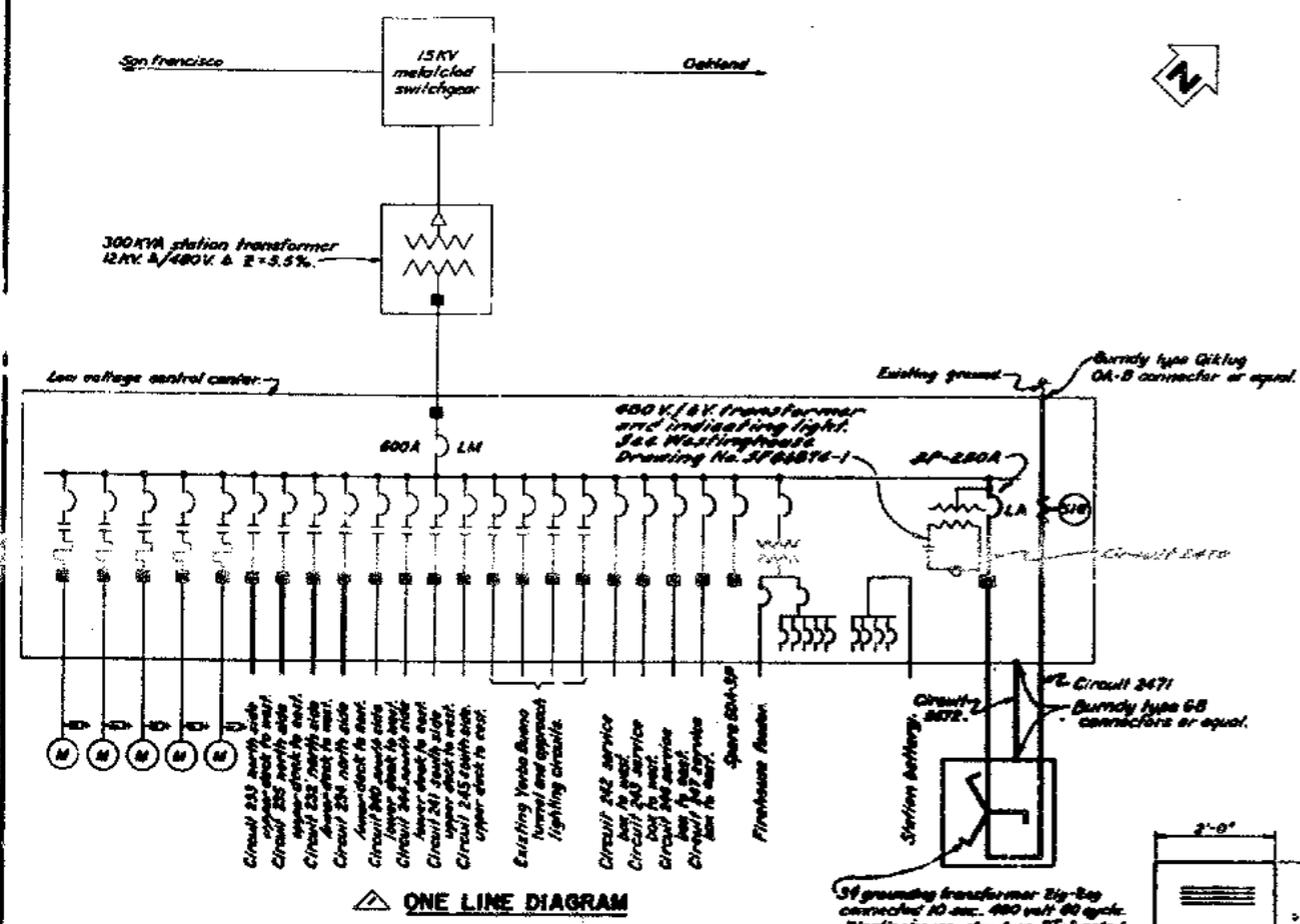
**EXISTING LOW VOLTAGE CONTROL CENTER**  
Scale: 1/2" = 1'-0"

**NOTES**

1. New work indicated by heavy lines.
2. Band armor of new and existing type L cables to existing conduit grounding bushings.
3. Substation is located on a concrete platform within pier W4 anchorage at elevation 154 ft. Access by existing ladders and walkways from lower deck.
4. See Sheet 34 for legend.



STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS DIVISION OF SAN FRANCISCO BAY TOLL CROSSING			
<b>SAN FRANCISCO-OAKLAND BAY BRIDGE RECONSTRUCTION LOWER DECK LIGHTING</b>			
<b>PIER W4 SUBSTATION</b>			
REVISION	DATE	DESCRIPTION	BY
AS BUILT WITH REVISIONS	08/17/82	As built with revisions	W.C.K.
			CHK
SCALE AS SHOWN	BRIDGE	SHEET No. 35	DRAWING: 9027-35F



- NOTES**
1. New work indicated by heavy lines.
  2. Bond armor of new and existing type L cables to existing conduit grounding bushings.
  3. See Sheet 34 for legend.

Panel 1	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6	Panel 7	Panel 8	Panel 9	Panel 10
Main circuit breaker	Air compressor	Compressor control	Air compressor	Combination Circuit 242 80A, 3-pole size 2	Combination Circuit 243 80A, 3-pole size 2	Circuit 244 80A, 3-pole size 2	Circuit 245 80A, 3-pole size 2	80 KVA transformer	Communication compartment
Air compressor	Air compressor		Air compressor	Combination circuit 246 80A, 3-pole size 2	Combination circuit 247 80A, 3-pole size 2	Combination circuit 248 80A, 3-pole size 2	Combination circuit 249 80A, 3-pole size 2	Rectifier and transfer outfit	Install two metal barriers. Install current transformer. Install ground-fault indicating relay.
Space	Space		Space	Combination circuit 250 80A, 3-pole size 2	Combination circuit 251 80A, 3-pole size 2	Combination circuit 252 80A, 3-pole size 2	Combination circuit 253 80A, 3-pole size 2		
						Photo-cell relays			

**EXISTING LOW VOLTAGE CONTROL CENTER**  
 Scale: 1/8" = 1'-0"



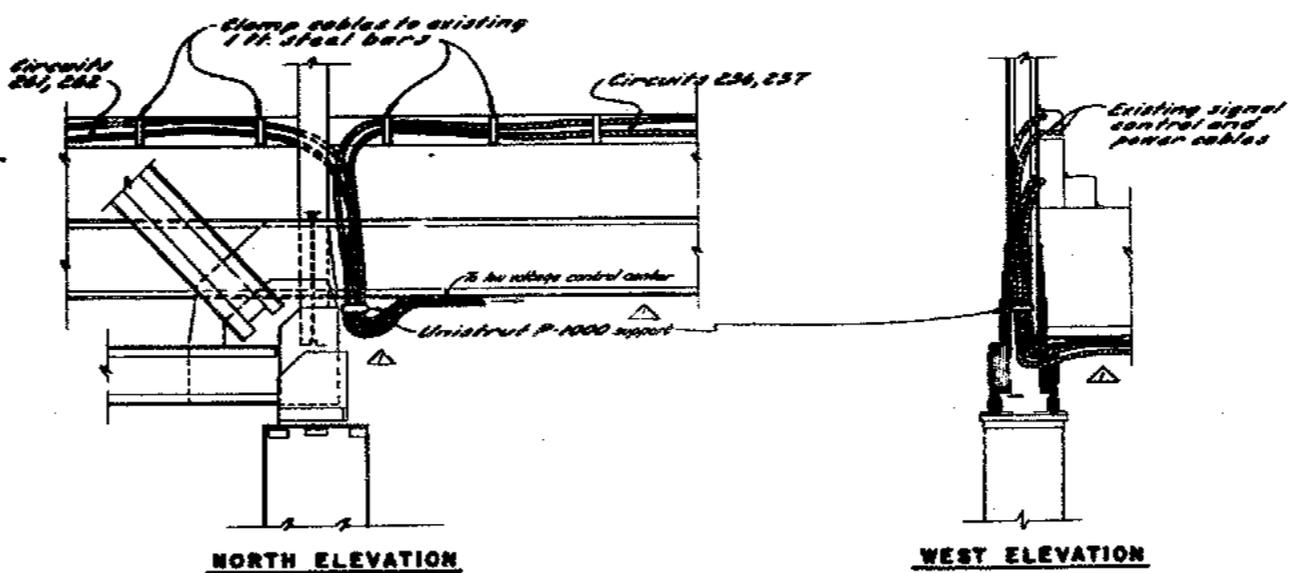
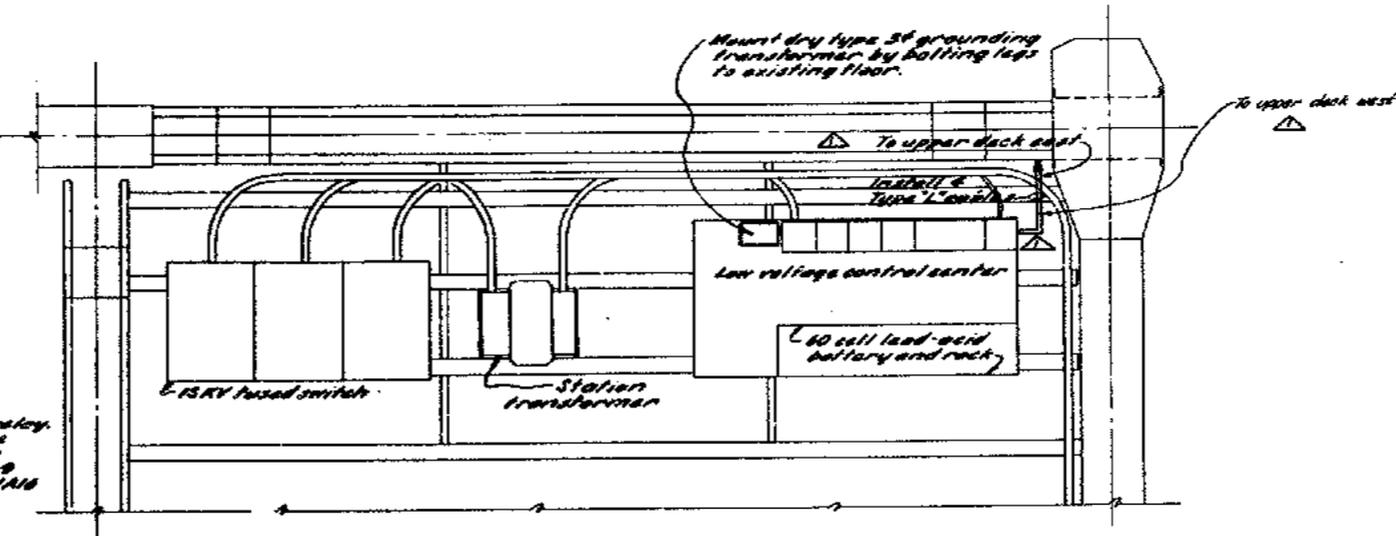
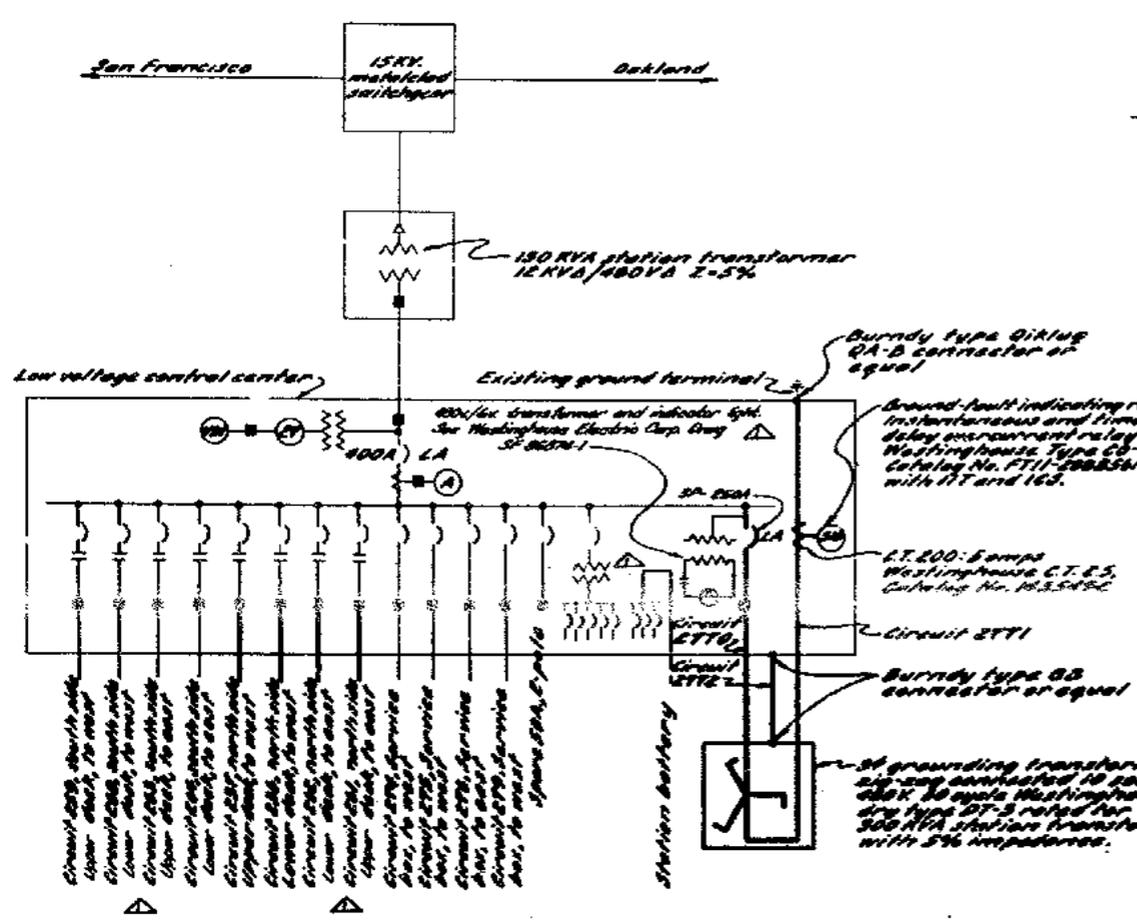
DATE	DESCRIPTION	BY	CHK

STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

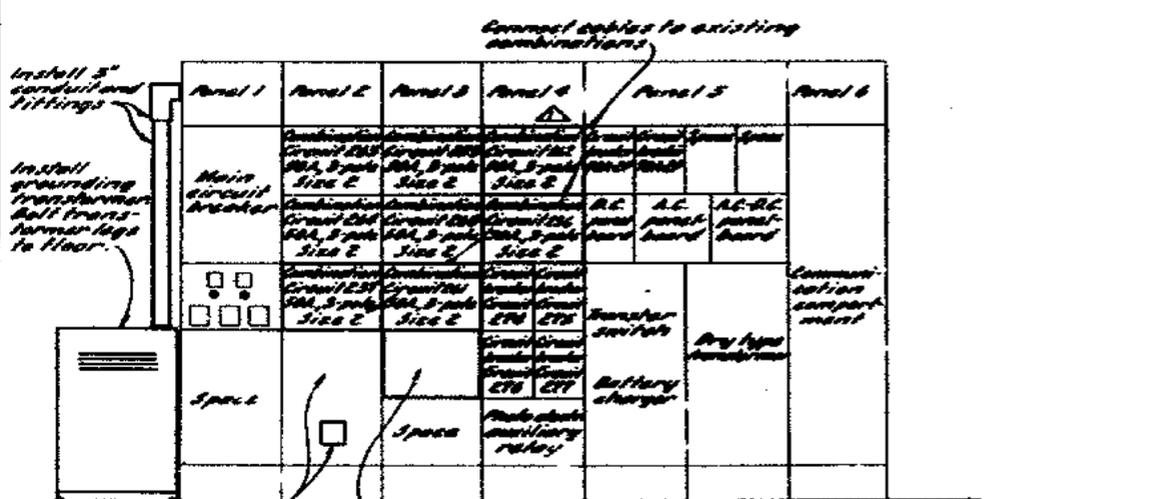
**SAN FRANCISCO-OAKLAND BAY BRIDGE  
 RECONSTRUCTION  
 LOWER DECK LIGHTING**

**YERBA BUENA ISLAND SUBSTATION**

SCALE AS SHOWN BRIDGE 34-04 SHEET No. 36 DRAWING-C-4027-36P



- NOTES**
1. New work indicated by heavy lines.
  2. Band armor of new and existing type L cables to existing conduit grounding bushings.
  3. Substation is located on a steel structural platform within Pier E9 at elevation 127.11. Access by existing ladders and walkways from lower deck.
  4. See Sheet 34 for legend.



MARK	DATE	DESCRIPTION	BY	CHK
		As built with revisions	LLS	WST
		REVISION		

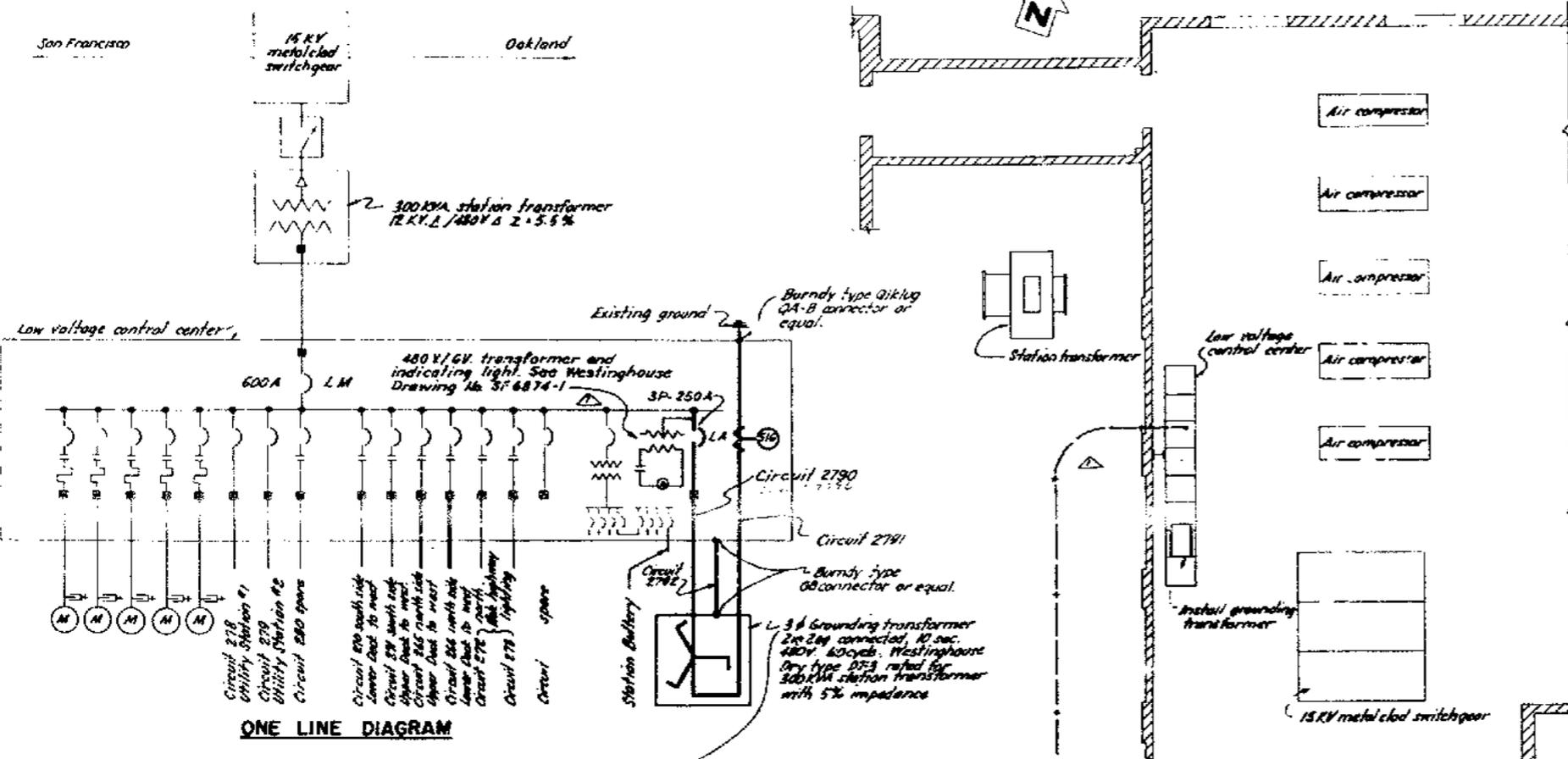
SCALE AS SHOWN BRIDGE 34-04 SHEET NO. 37 DRAWING-4027-37

STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

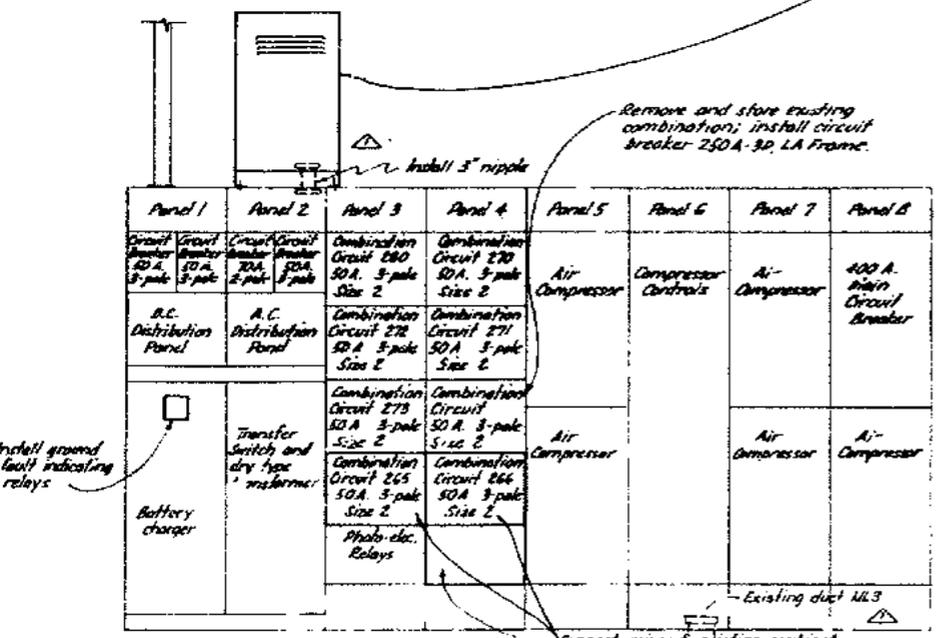
**SAN FRANCISCO-OAKLAND BAY BRIDGE  
 RECONSTRUCTION  
 LOWER DECK LIGHTING**

**PIER E9 SUBSTATION**

San Francisco      Oakland

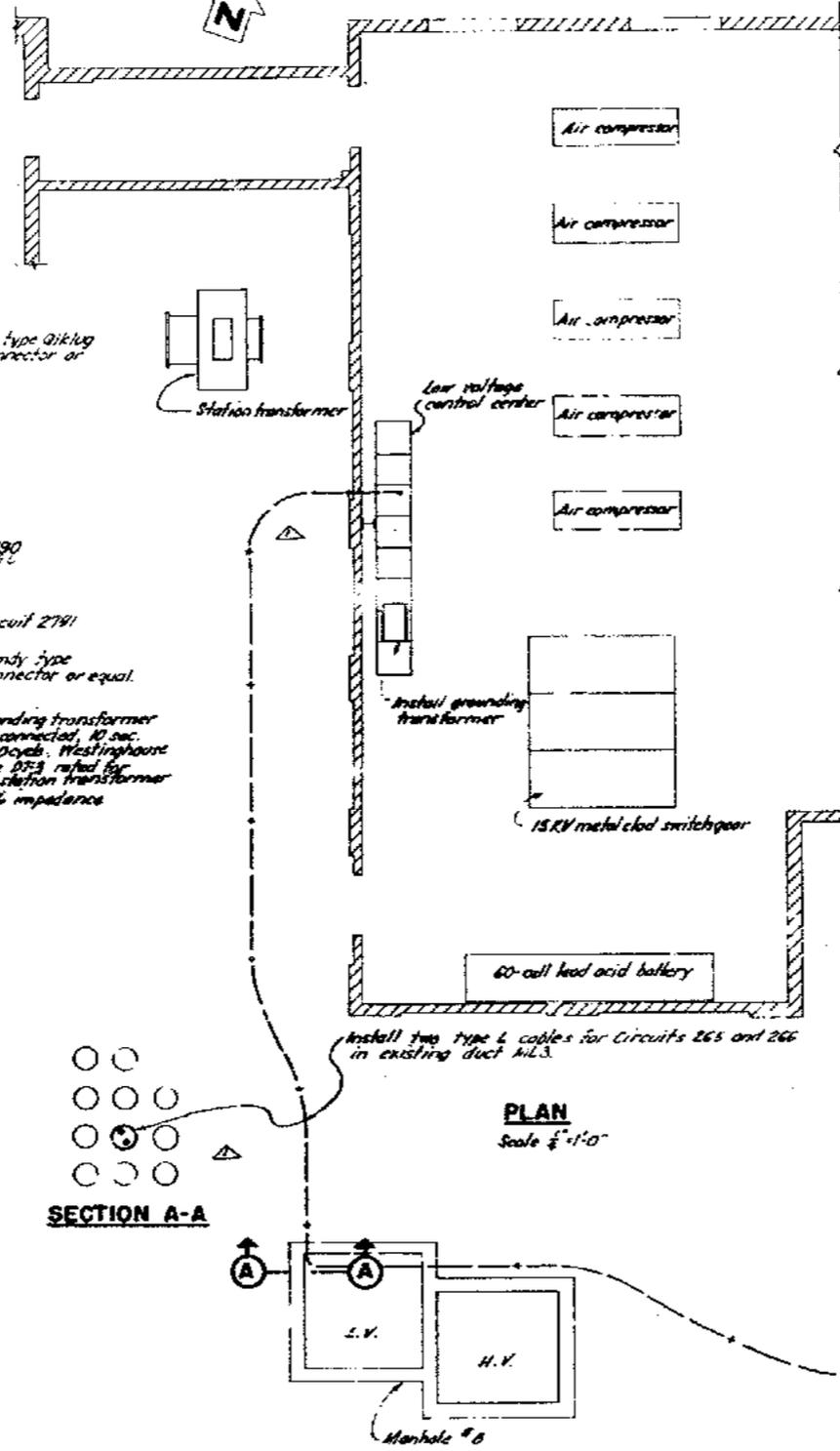


**ONE LINE DIAGRAM**



**EXISTING LOW VOLTAGE CONTROL CENTER**

Scale 3/4" = 1'-0"



**PLAN**

Scale 3/4" = 1'-0"

**SECTION A-A**

**NOTES**

1. L.A. mark indicated by heavy lines
2. Bond armor of new and existing type L cables to existing conduit grounding bushings.
3. See Sheet 34 for legend.



STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

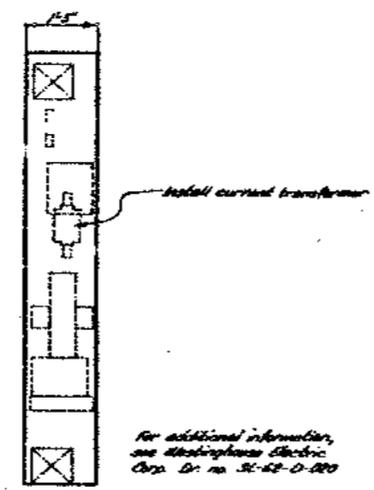
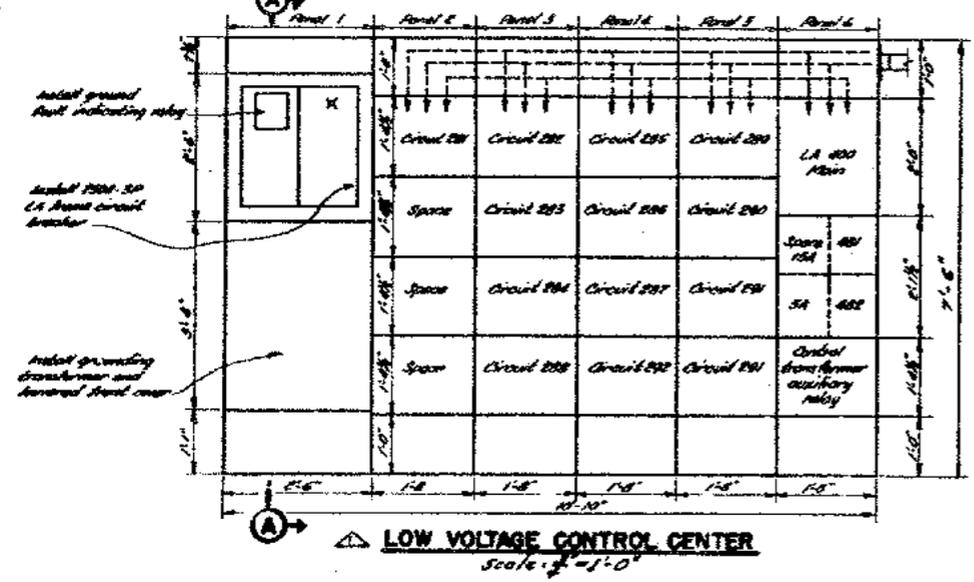
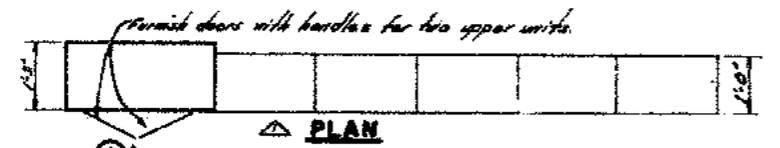
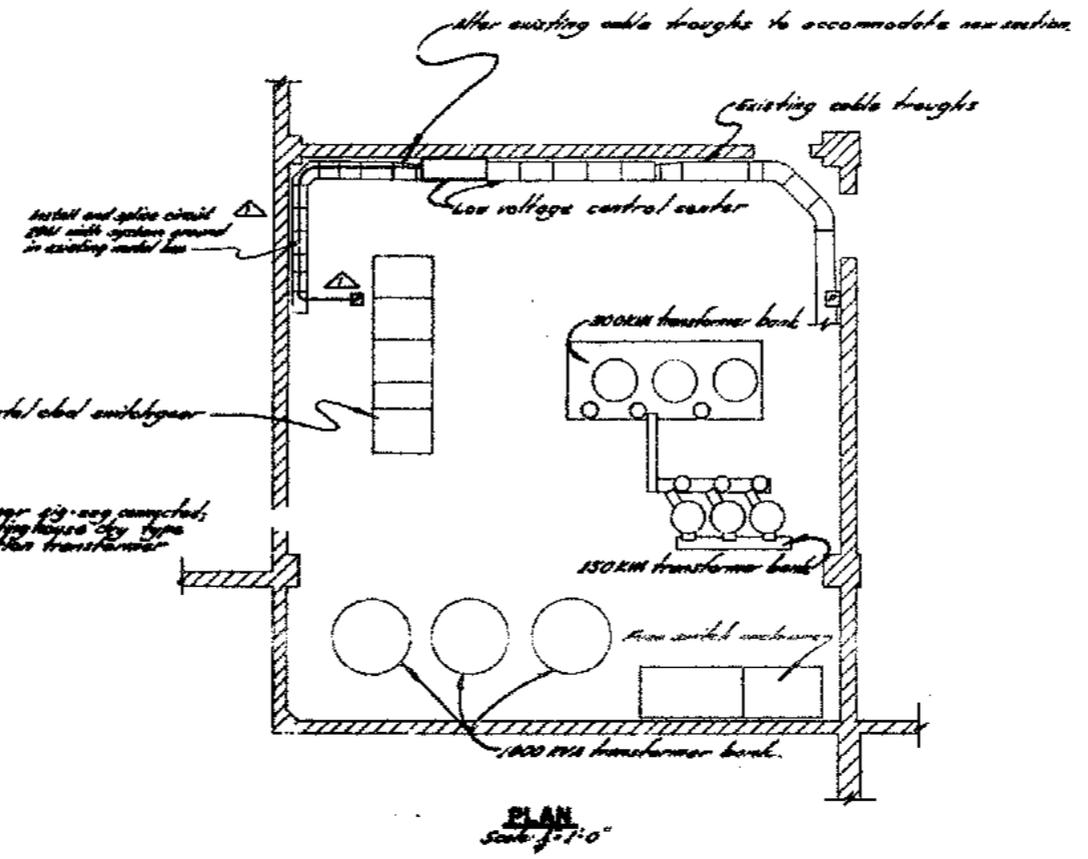
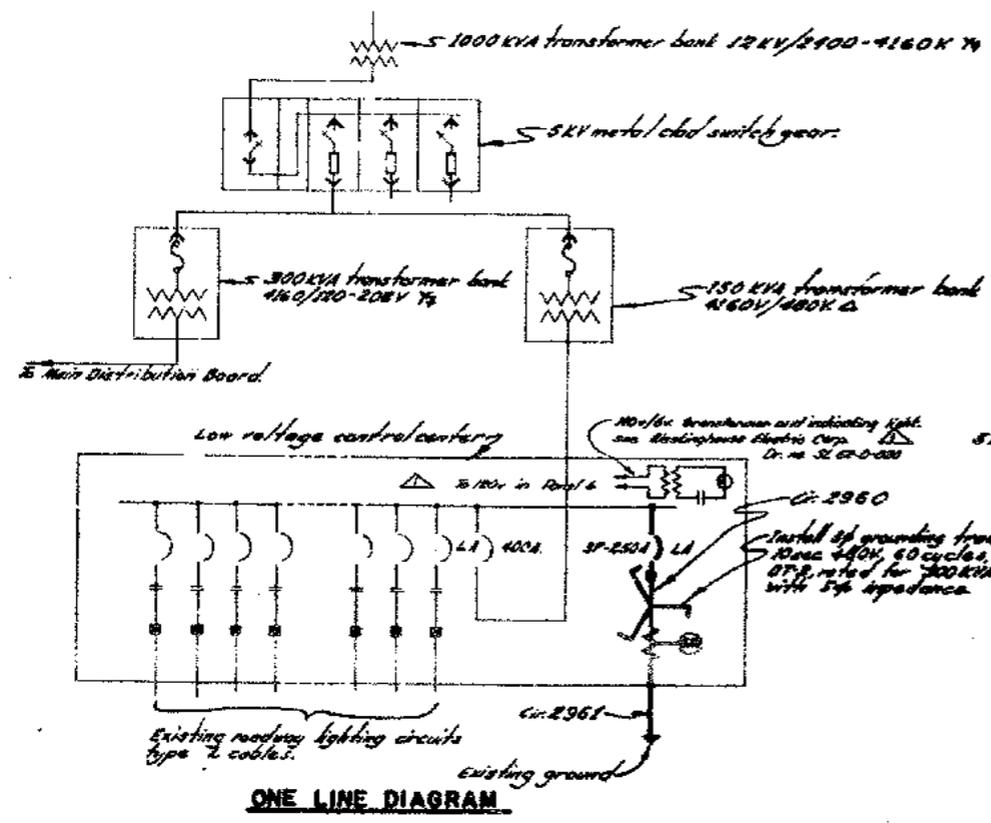
**SAN FRANCISCO-OAKLAND BAY BRIDGE  
RECONSTRUCTION  
LOWER DECK LIGHTING**

**MOLE SUBSTATION**

33-23  
34-04

SCALE AS SHOWN    BRIDGE 34-04    SHEET NO. 38    DRAWING C-4027-38

MARK	DATE	DESCRIPTION	BY	CHK
		REVISION		



- NOTES**
1. New work indicated by heavy lines.
  2. Finish new section (Panel 1) of low voltage control center with #3A #61 gray enamel to match existing section.
  3. See Sheet No. 38 for legend.



REVISION	As built with revisions	LLS	N.S.P.
MARK DATE	DESCRIPTION	BY	CHK
	REVISION		

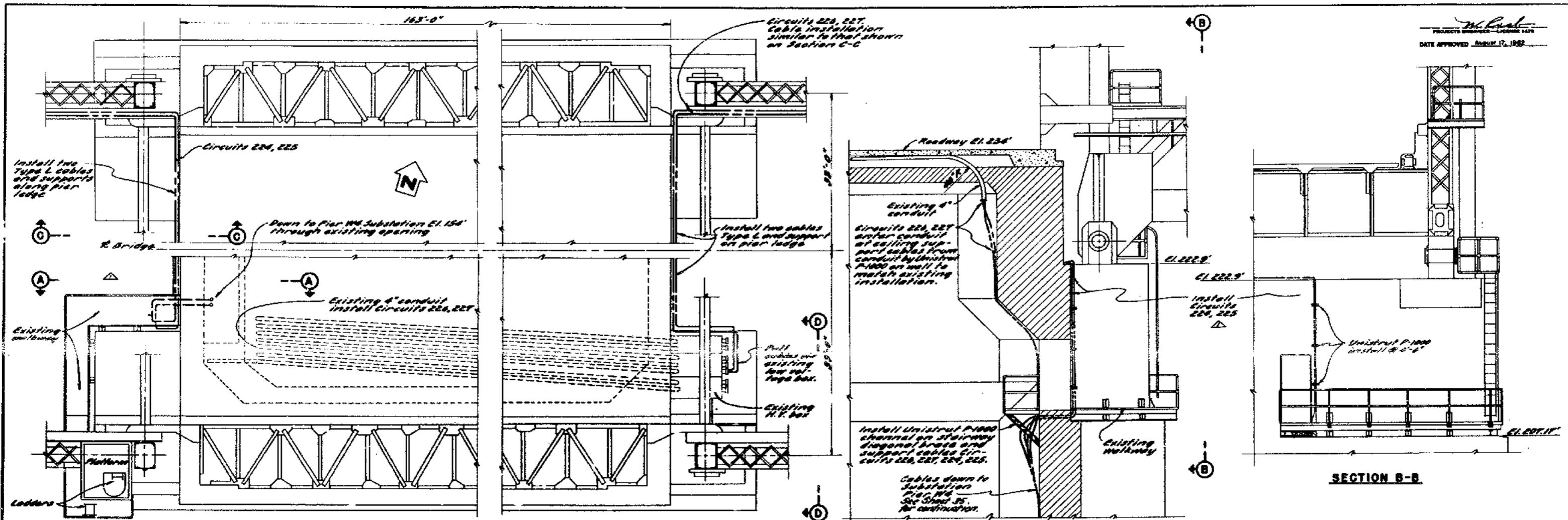
STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

**SAN FRANCISCO-OAKLAND BAY BRIDGE  
RECONSTRUCTION  
LOWER DECK LIGHTING  
SUBSTATION NO. 5**

35-23  
34-03  
BRIDGE 34-04

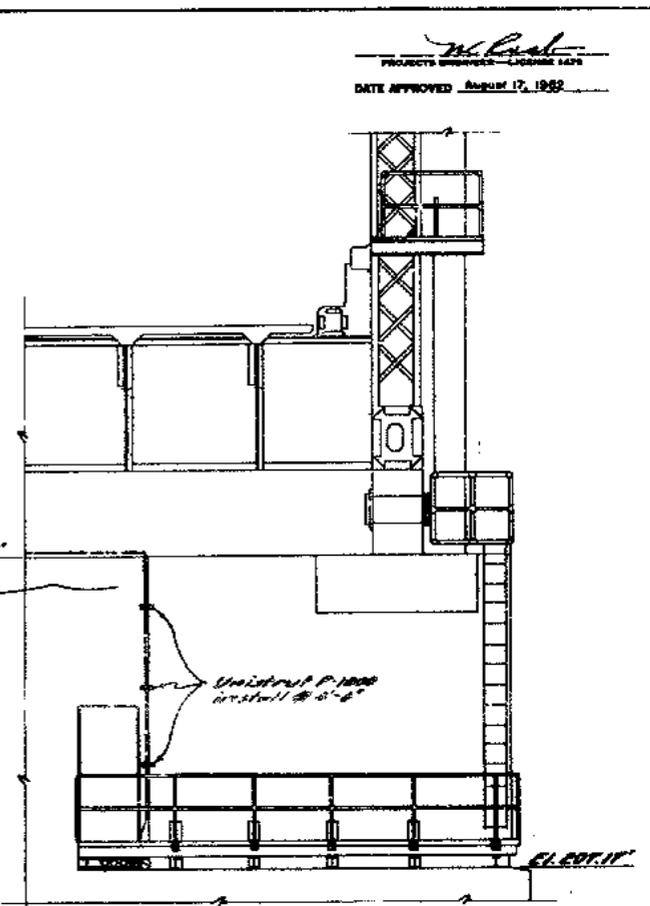
SHEET NO. 39

DRAWING C-40.2-39A

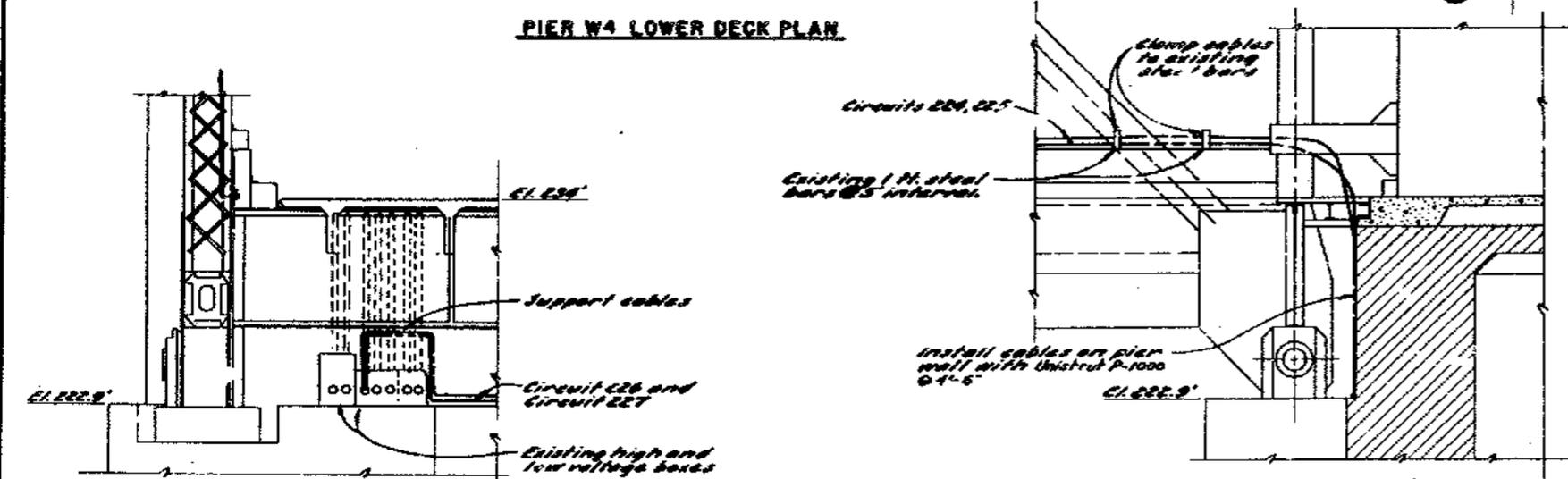


**PIER W4 LOWER DECK PLAN**

**SECTION A-A**



**SECTION B-B**



**ELEVATION D-D**

**SECTION C-C**

**NOTES**  
 1. New work indicated by heavy lines.



AS BUILT WITH REVISIONS		BY	CHK
MARK	DATE	DESCRIPTION	REVISION

STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF SAN FRANCISCO BAY TOLL CROSSINGS

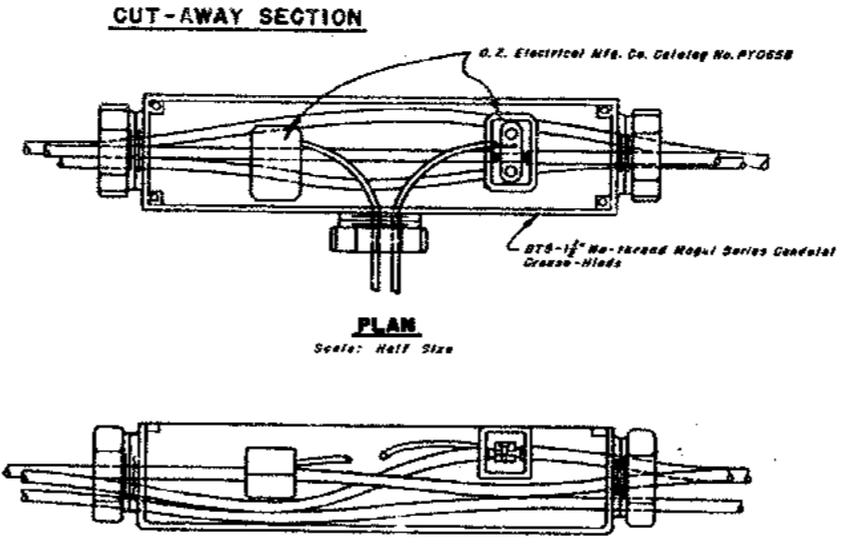
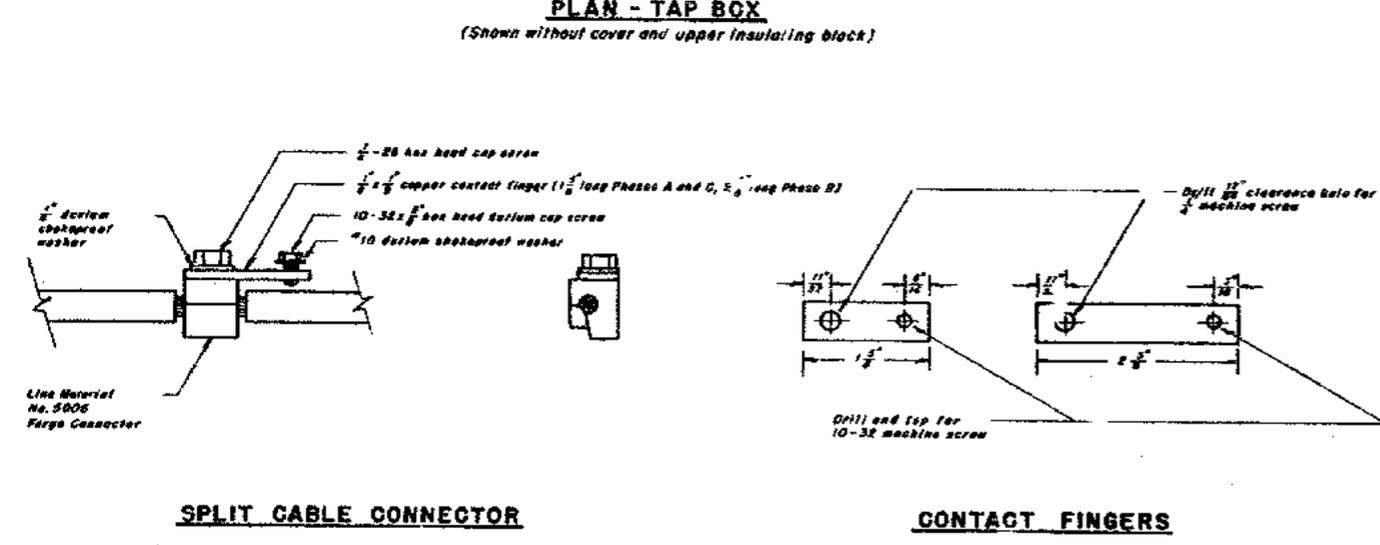
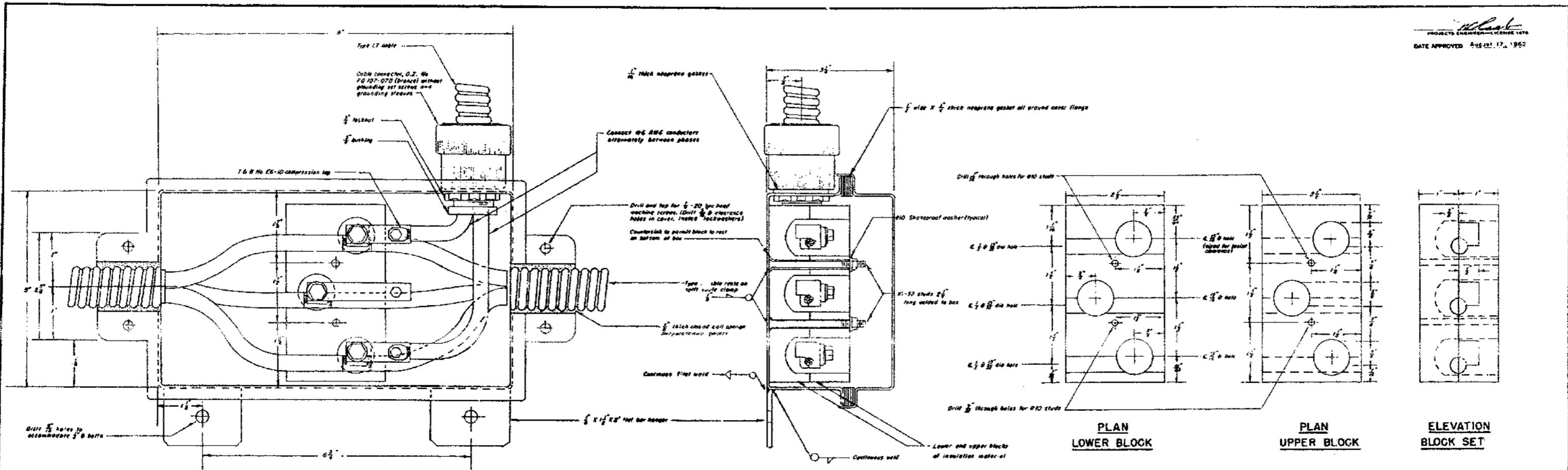
**SAN FRANCISCO - OAKLAND BAY BRIDGE  
 RECONSTRUCTION  
 LOWER DECK LIGHTING**

**PIER W4 CABLE INSTALLATIONS**

33-25  
 34-03  
 34-04

SCALE 1/4" = 1'-0" BRIDGE SHEET No. **40** DRAWING C-4027-407

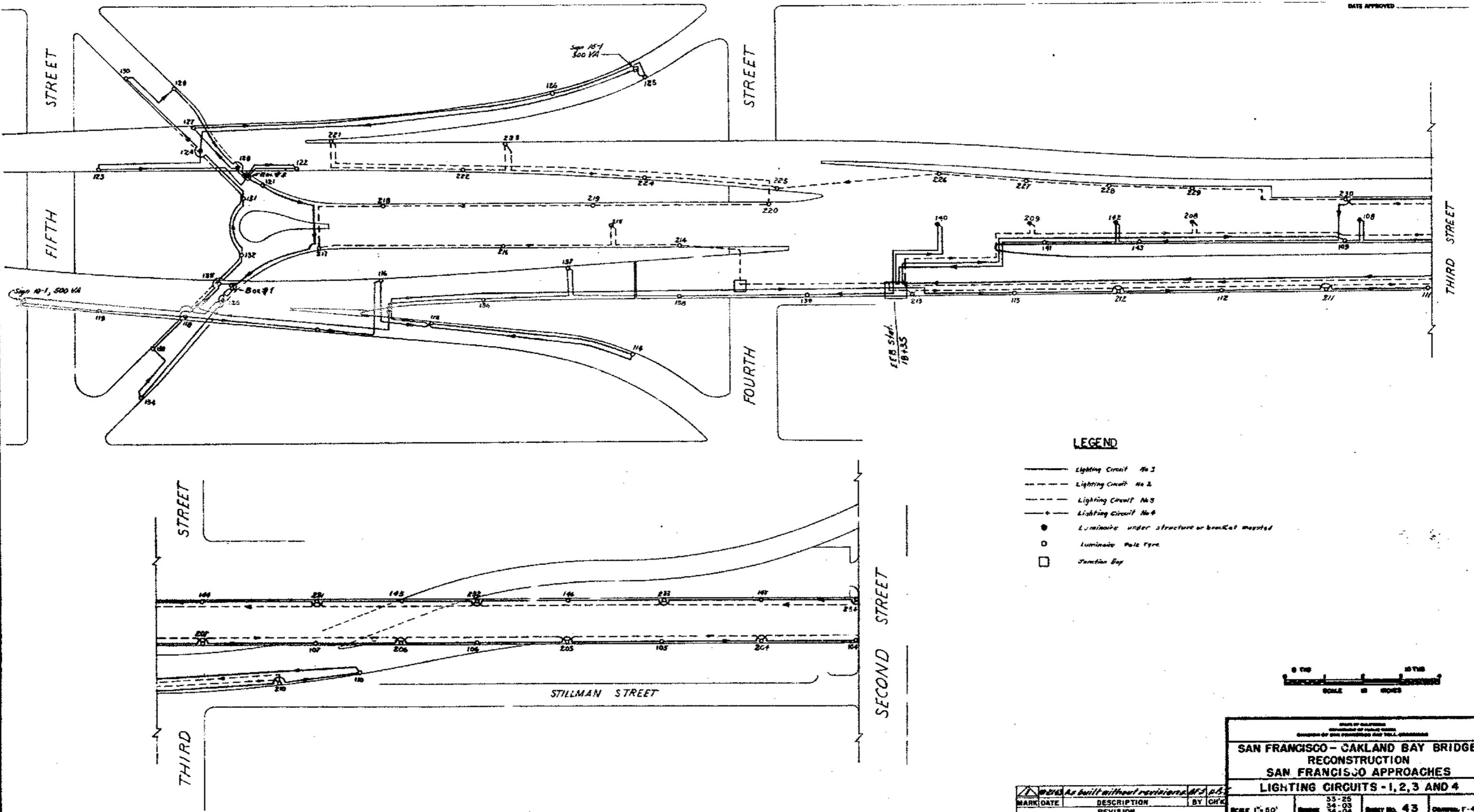




1. Threadless junction boxes as shown shall be installed to provide branch circuit connections to Type CS and CD roadway lighting luminaires between Bore 21 and 41 of the continuous approach.
2. Tap boxes shall be installed to provide branch circuit connections from the Type L cable, ABOV roadway lighting circuits, to Types BS, ED, and ET roadway lighting luminaires.
3. Each tap box shall consist of two sheet steel sections, of not less than #12 ga which shall assemble about an uncut Type L cable to make a weatherproof and airtight enclosure. (It should be specifically noted that the armor jacket and insulating materials are removed, but the conductors are not to be removed.) Insulating blocks for tap connections shall be fabricated from cables reinforced polyether as manufactured by Gihon Corporation, or equal. All conducting pieces shall be copper, ASTM B-187-60. The Type L cable tap and other box with interlocking armor cable terminator, C.E. Electric Manufacturing Co. Inc. Parting style "P6" or equal, through cable entries shall be used with thick weathering seals, also interlocking seals, also interlocking shall be weatherproof, lock tight, and fabricated from metal metal or approved equal.
4. Contractor shall submit before fabrication one prototype tap box with detailed shop drawings for specific approval. An observable test with box in simulated installation and with box being vibrated not less than 1/2 inch in two directions for a minimum of 300 cycles at 150 to 300 CPM by contractor as part of his prototype submittal.



STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS DIVISION OF SAN FRANCISCO BAY TOLL CROWNSHIP			
<b>SAN FRANCISCO - OAKLAND BAY BRIDGE                  RECONSTRUCTION                  LOWER DECK LIGHTING</b>			
<b>TAP BOX DETAILS</b>			
MARK DATE REVISION	DESCRIPTION REVISION	BY CHK	33 - 25 34 - 03 34 - 04
SCALE FULL SIZE		BRIDGE	SHEET NO. 42
DRAWING C-4027-42F			



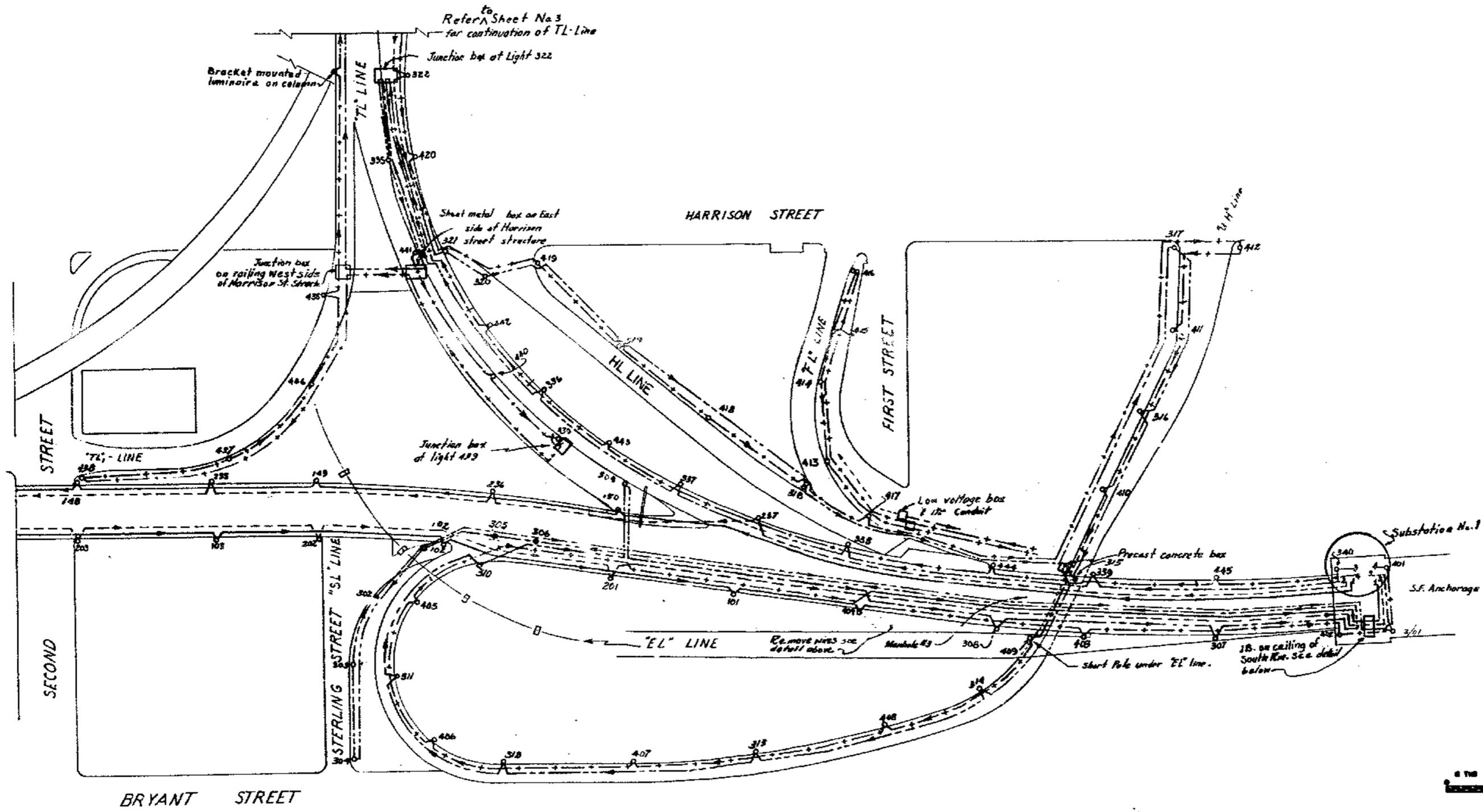
**LEGEND**

- Lighting Circuit No. 1
- - - Lighting Circuit No. 2
- Lighting Circuit No. 3
- Lighting Circuit No. 4
- Luminaires under structure or bracket mounted
- Luminaires Pole Type
- Junction Box



<small>STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS AND TOLL BRIDGES</small>			
<b>SAN FRANCISCO - OAKLAND BAY BRIDGE</b>			
<b>RECONSTRUCTION</b>			
<b>SAN FRANCISCO APPROACHES</b>			
<b>LIGHTING CIRCUITS - 1, 2, 3 AND 4</b>			
<small>DATE OF DRAWING</small> <small>APPROVED BY ENGINEER</small> <small>DATE OF THE DRAWING AND TOLL BRIDGE</small>	<small>SCALE 1" = 50'</small>	<small>REVISION</small>	<small>SHEET NO. 43</small>

<small>As built without revisions. M.S. P.S.</small>			
<small>MARK</small>	<small>DATE</small>	<small>DESCRIPTION</small>	<small>BY</small>



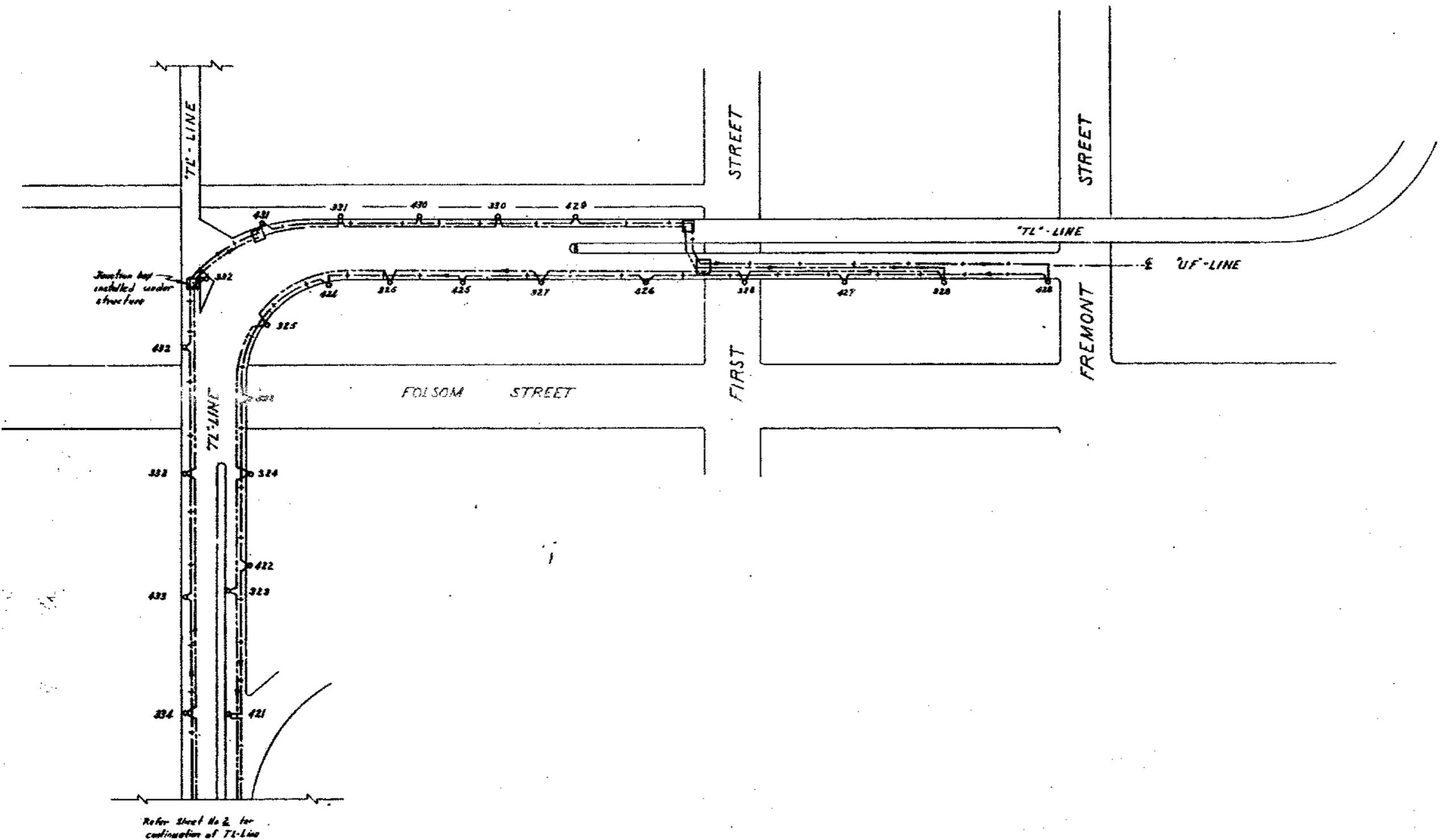
STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF SAN FRANCISCO CITY ENGINEERING

**SAN FRANCISCO - OAKLAND BAY BRIDGE  
RECONSTRUCTION  
SAN FRANCISCO APPROACHES  
LIGHTING CIRCUITS - 1, 2, 3 AND 4**

DATE	DESCRIPTION	BY	CHK
33-25			
34-03			
34-04			

SCALE 1" = 50'  
SHEET NO. 44  
DRAWING F-40275

102163	As built without revisions	DFS	NB
MARK	DATE	DESCRIPTION	BY
			CHK
		REVISION	



STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF SAN FRANCISCO BAY TOLL BRIDGES

**SAN FRANCISCO - OAKLAND BAY BRIDGE  
RECONSTRUCTION  
SAN FRANCISCO APPROACHES**

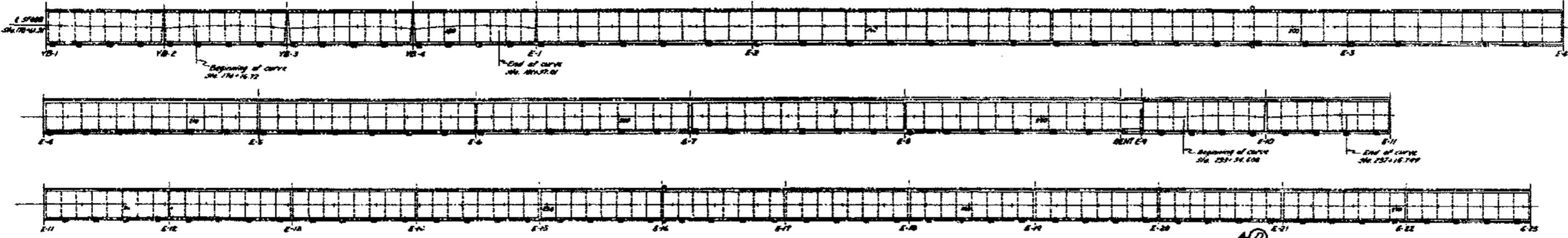
**LIGHTING CIRCUITS - 1, 2, 3 AND 4**

SCALE 1" = 50'

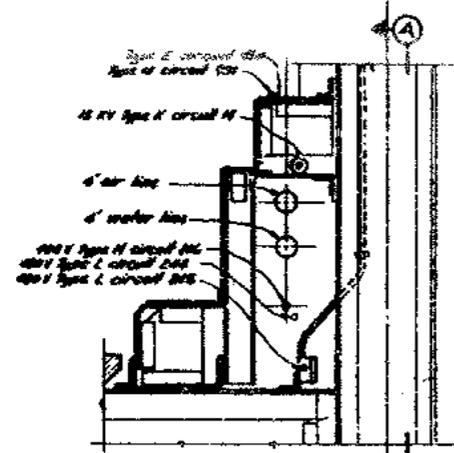
DATE 33-83  
BY GWK  
REVISION 34-03  
34-04

SHEET NO. 45 DRAWING F-4027-1

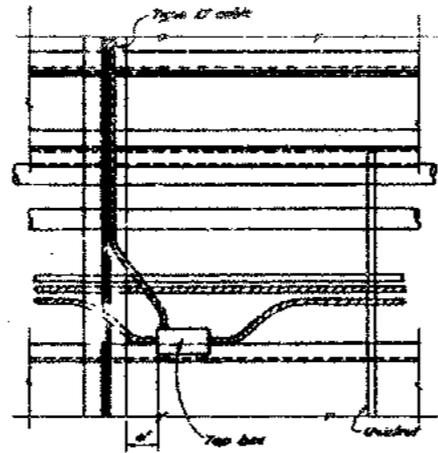
As built without revisions			
MARK	DATE	DESCRIPTION	BY
		REVISION	GWK



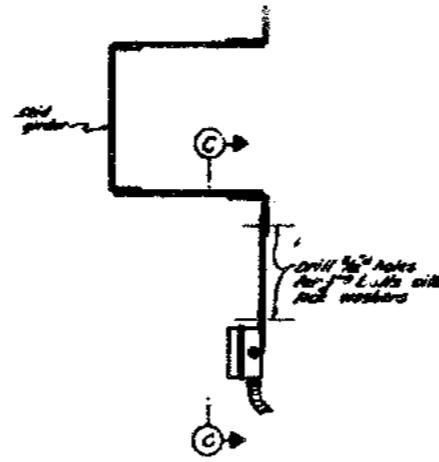
**LOWER DECK PLAN**  
 Scale: 1" = 100'  
 ■ Indicates existing tap box location



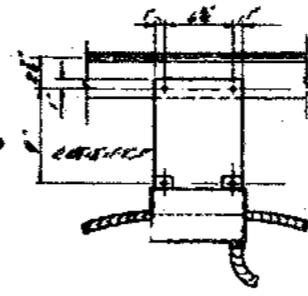
**TYPICAL SECTION A-A**  
 Existing cable installation for tap box



SECTION A-A

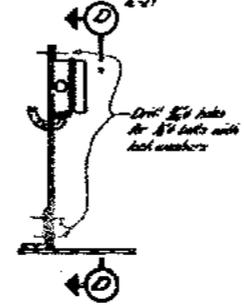


**TYPICAL SECTION C-C**  
 THROUGH SKID GIRDER

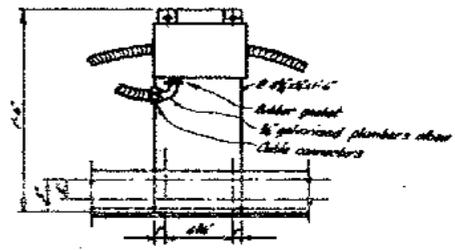


SECTION C-C

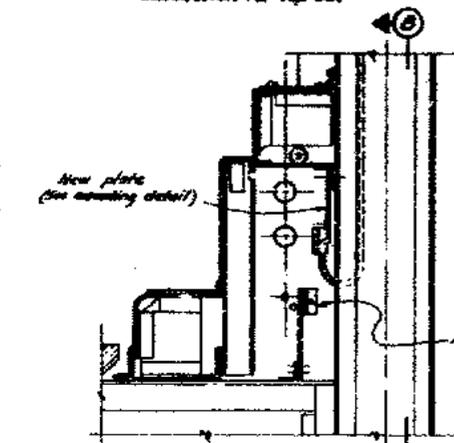
**MOUNTING DETAIL**  
 Scale: 1/2" = 1'-0"



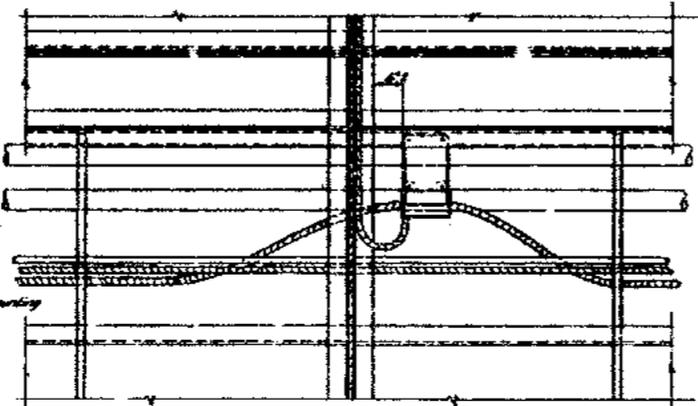
**TYPICAL SECTION D-D**  
 THROUGH SKID GIRDER  
 (Alternative)  
 No Skids



**SECTION D-D**  
 (Alternative)  
 No Skids



**TYPICAL SECTION B-B**  
 New cable installation for tap box



SECTION B-B

- NOTES:**
1. Refer to drawing C-407-3 for original installation details.
  2. Mounting bars to be hot-dip galvanized after fabrication.
  3. Repair all deteriorating tap boxes.
  4. Where there is insufficient slack in 1/2" or 3/4" cables, alternate mounting is to be applied.



MARK	DATE	DESCRIPTION	BY	CHK'D
		REVISION		

STATE OF CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
 DIVISION OF SAN FRANCISCO BAY AREA  
**SAN FRANCISCO-OAKLAND BAY BRIDGE**  
**RECONSTRUCTION**  
**LOWER DECK LIGHTING**  
**TAP BOX RELOCATION**  
 SHEET NO. 15-25  
 SCALE 1/2" = 1'-0"